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The United States Navy

*A Kindly Critic Shows How Its Efficiency
Can Be Improved in Various Ways*

By S. W. Utley

TO THOSE who are familiar with our various types of lake vessels, but who have never had an opportunity of living aboard a battleship, the comparison below between the Utah, the Seeandbee, the largest of our side-wheel passenger steamers, and the W. P. Snyder Jr., or her sister ship, the Col. Jas. M. Schoonmaker, among the largest of the bulk freighters, will give a general idea of relative size, although it must be remembered that the ships of the Utah class are now in third place as far as size is concerned, being surpassed by the Wyoming and Arkansas, while they in turn have given way to the New York and Texas.

on her boilers than would be the case in a boat like the Snyder.

When one attempts to draw conclusions from experiences, such as those I have attempted to describe, he is immediately struck by the fact that there is probably no other subject in the country on which popular opinion is so diametrically opposed to actual facts as in the consideration of the personnel making up the modern navy. The old time sailor-man, with his picturesque profanity, his ability to consume rum and his various other qualifications which made him an ideal figure for the dime novel, has passed away along with the square-rigged war vessel and in his place has come a clean-cut, wide-

our fleet today are nothing but boys, and they are an all-around, clean-cut, well-behaved, manly crowd. The idea that the navy is a sort of a reform school is absolutely wrong. Only 20 per cent of those who apply for enlistment are accepted, and there is no room in it for the fellow who is bad or undesirable. If such a man succeeds in getting by the recruiting officer, it does not take long for the executive officer of the ship to which he is assigned to find him out and get rid of him. The idea of the navy today is not to train a man into being a mere cog in a machine, but rather to develop his individuality and his thinking powers, and while he must be trained to co-ordinate and co-operate with others, this training is calculated to stimulate rather than to repress his individuality. In the factory or in the store, if a man shows exceptional proficiency in one line, there is always a temptation to keep him there because he does that work better than some one else would. On shipboard, however, if a man shows any qualifications that in any way differentiate him from the rest of the men, every wide-awake officer and petty officer stands ready to help to push him ahead, because there is always a cry for the best possible men for each step higher up.

Of course, discipline must be preserved, but it is certainly not any more severe than that required in many well regulated mercantile and manufacturing plants, the main difference being that a ship is both a

COMPARISON OF U. S. S. UTAH WITH VARIOUS LAKE VESSELS.

	Seeandbee	W. P. Snyder Jr.	U. S. S. Utah
Length over all.....	500 ft. 0 in.	617 ft. 3 in.	510 ft. 0 in.
Extreme width	96 ft. 8 in.	64 ft. 2 in.	88 ft. 2½ in.
Draft	15 ft. 0 in.	19 ft. 0 in.	28 ft. 6 in.
Horsepower	11,000	2,600	28,000
Trial speed	22 miles	13.6 miles	24.2
Tonnage	6,381 (full load)	22,603	21,825
Engines	Inclined 3 cylinder compound	Vertical quadruple expansion	Parsons turbines
Coal burned per mile steamed.....		Season 1912 and 1913 345 lbs. per mile at 11.15 miles per hour	Mediterranean trip, 692 lbs. at 12 miles per hr.

Perhaps the most interesting of these figures to the lake man is the big difference in draft and the tremendous difference in horsepower, the battleship having 11 times the horsepower of the freighter. The comparison of the coal burned is interesting, although scarcely fair, inasmuch as the Utah's condensing plant and her electrical plant are far a greater drain

awake, intelligent American youth, who has left the city, the farm and the prairie, drawn perhaps by a desire for travel and adventure, perhaps by the calling of the blood of seafaring ancestors generations removed. Although it seems almost incredible, it is a fact that the average age of all the men on this ship was under 22 years! The sailors who are manning

workshop and a home, and a man is under regulation during his play hours as well as during his working hours. But when real men, no matter if some of them are called officers and some of them sailors, are living together within the close confines of a 500-foot ship, striving earnestly day by day for the same results, artificial distinctions and discriminations cannot long stand up. The naval officer has a far more human contact with the men working under him than does the foreman of an industrial plant, and the interest shown by the executive of a large plant in the vital life of the men who work for him cannot be compared to the interest of the executive officer in the welfare of the men he commands.

As we sat around the wardroom table one night, Capt. Cone remarked: "I keep reminding the officers that it is only a matter of circumstances, in many cases, that makes us officers and them sailors. Basically they are as able as we are; just change our opportunities and they would be on our place and we in theirs." With this sort of spirit controlling the action of ranking officers, it is no wonder that the ships of the fleet are the happy homes that they are today. From my own experience, I believe that the young man of sound character, who does not have an opportunity of going to college, can take no better finishing course before he starts life's work than to serve one enlistment aboard the ships of the fleet, and I am very sure that he is running no more danger of lessening his high moral standards than he does when he attends the average university.

Life of the Officer

If one is to judge from the questions I have been asked, to a large part of the intelligent people of this country the average naval officer is a snobbish, conceited pet of the government, who divides up his time between drinking, gambling, bullying his subordinates and dazzling the eyes of admiring lady friends. Not one out of 10,000 of the citizens of the country seem to have any idea of the life of the officers whom they have hired to man their navy, nor have they any conception of the ideals of this profession. For the last 20 years I have had the pleasure of a large acquaintance in almost all walks of life, among lawyers, doctors, teachers and business men, but in none of these professions or in any one line of business, have I ever found a body of men who, as a whole, average so high from the standpoint of ability, character, manhood and

sociability as do the men who make up the officers of the United States navy. Nor is this surprising when one comes to analyze the conditions surrounding their life, for in no profession of which I have any knowledge, are the requirements so exacting.

Graduates of Annapolis

Almost all of our naval officers are graduates of the academy at Annapolis, to which they are appointed by the congressmen of the country and which they enter only after severe physical and mental examination. The work there is very rigid, a large percentage of the men who enter dropping out through inability to handle it, so that less than 70 per cent of the entering classes finally graduate at the end of four years and are commissioned as ensigns in the navy. Several years of hard work follow and then as vacancies occur the young officers are promoted to the next higher grade, not, however, until they have successfully passed a very rigid examination which results in still more of them dropping out. This is repeated until the man finally reaches flag rank in the evening of his life, each promotion having been won only after he has proved to a cold-blooded examining board his mental qualifications to hold the higher rank.

There is no other profession which gives such all-around training or requires such all around proficiency, for under our present regulations every navy officer must be ready to do any of the work that is required of any officer of his own grade. Certain men are not detailed for engineering work, others for gunnery work, etc., but each man must take his turn at each department. Our captain had come to the ship from the command of the navy yard at New York and previously had been connected with the hydrographic work in the Orient and on the Mississippi. The executive officer had just stepped down from a position as head of the Bureau of Steam Engineering in Washington. The navigating officer was chief engineer of the ship on my previous trip. The first assistant engineer had just come from Washington where he had been executive officer on the Dolphin, and I suspect had never seen turbine engines such as we had aboard the ship. A number of the watch officers had just come out of the engine room and the engine room officers had recently been relieved from deck work. The young officer faces the proposition that he must be ready and proficient at any time in steam engineering, electrical

engineering, ordnance and gunnery, navigating and ship handling; that he must qualify himself to handle and to lead men and that any time he may be ordered to make surveys, construct charts or run a navy yard or shore station. In his spare time he must study strategy and international law, because an error on his part in handling some international question may plunge his own country into war. One young officer from the Utah's battalion, a man out of the academy scarcely three years, found himself in a position in Vera Cruz where he was practically chief of police for five days, with the necessity of starting up the electric light plant, storage system, waterworks, street-cleaning departments and street cars, in addition to burying the dead, holding court, releasing or paroling some 300 prisoners, awarding punishment, signing passes and issuing permits to hold bull fights, carry knives, sell beer and hold funerals, a rather large contract to load on the shoulders of a youngster under 25, and yet the kind of a contract that a naval officer must be ready for at any moment of the day or night from the beginning to the end of his service. It takes *real men with real ability* to acquit themselves with credit in the battleship fleet today.

In addition to the examinations every three months, a report covering four long pages of paper is made to Washington on each and every officer and this report becomes a part of his official record. Any lack of professional qualification, dereliction in duty, evidence in drunkenness or disorderly conduct, and, on the other hand, anything of an especially praiseworthy nature that an officer may have done finds its way into this report and onto his record, and this record, plus the examination already spoken of, forms the basis of his promotion. The higher he rises the more the record counts. I know of nowhere in civil life where any system has been devised for so thoroughly keeping track of a man's ability or so constantly stimulating him to his best efforts, for the conscientious naval officer thinks as much of his record as he does of his life.

An Unfortunate Order

From the standpoint of the public estimate of the navy, it has always seemed to me that the recent order abolishing the wine mess was unfortunate, as it simply confirmed the erroneous opinion the people have that naval officers as a whole are addicted to the excessive use of liquor. My own observations at sea have been that they are unusually free from it,

and I have never known an equal number of men of the same social standing to consume so little liquor as was consumed aboard the Utah on last year's cruise. The regulations have long since prohibited the carrying of distilled liquor aboard ship, nor have they allowed the carrying of any grog or liquor by the crew. They have, however, permitted the officers to organize a sort of joint stock company, known as the wine mess, which carries and furnishes to any officer who desired to pay for it, light wines, beer, cigars, etc., but the tendency among the officers themselves during the last few years has been to discourage the use of even light liquor when at sea, for the feeling of late years is strong that no man can rise to high rank whose record contains an instance of drunkenness. Many officers who are perfectly willing to drink ashore will not touch a drop aboard ship, feeling that in case anything happens while they are on duty they cannot afford to have it said that they had been seen to take a single glass. The lack of drinking aboard ship is even more remarkable when one considers that a naval officer is required almost continually to represent his country at social functions, and that entertaining and being entertained is as much a part of his duty as training for battle. When a ship is being entertained in a foreign port, or even in some of our own ports, the detail ordering officers to attend "Mrs. Jones' Pink Tea" and "Mrs. Brown's Evening Reception" is posted the same as details for battle stations, and these orders must be obeyed in exactly the same way. As drinking is apt to occupy a rather prominent place on such occasions, it is almost impossible for the naval officer, especially in foreign waters, to keep from it without being rude at a time when rudeness reflects not only upon him personally, but upon the nation he is representing. Under such circumstances, it is surprising to me that naval officers can control their tastes in the way they do, and that there is less drinking among them than among any other class I know.

Skill of Lake Captains

A man who is used to the way lake captains handle their ships, who has seen them threading the narrow rivers and congested harbors, laying their vessels alongside of each other as gently as though they were egg shells as they wait for the locks at the Soo, or handling them along the iron and coal docks, is forced to the conclusion that our naval officers have not learned to handle the big

vessels entrusted to their charge. When we reached home, the Utah went alongside a straight dock in the Brooklyn navy yard, and, notwithstanding the fact that we went in at slack tide, we were actually pushed into our berth by seven navy yard tugs and with the navy yard pilot on the bridge. She was a big, heavy ship, to be sure, but she has lots of power and quadruple screws, which make her much easier to handle than a heavily loaded lake vessel and yet I do not believe that any captain of a 500-foot freighter on the lakes would have hesitated to lay his own vessel alongside of that dock without outside aid of any kind. Of course, there are many reasons which explain this condition of affairs. Whether they excuse it or not, it is a matter of opinion. Naval officers jump from one job to another so fast that a captain is in command of a ship too short a time to really become expert in handling her. He has to go alongside of a dock only six or eight times during the entire time, nor does the system under which he works tend to cause him to improve what opportunities he does get. A couple of years ago after the review in New York, the Michigan battalion was transferred to the scout cruiser Birmingham at Delaware breakwater, to be taken to the yard at Philadelphia.

During the four years previous, our battalion had cruised from one end of the lakes to the other, from Buffalo to Duluth, to Chicago and most of the way ports, going through the Detroit, St. Clair, St. Mary's and Portage rivers and being forced sometimes to run these rivers at night, and during all that time we had handled the ship along without aid of pilots or outside help, feeling that we must either acquit ourselves at handling the ship or else acknowledge that we were unfit for the duties devolving upon us. Our surprise can be imagined, then, when we went upon the Birmingham bridge and found that she was being taken up the Delaware to her own home yard by a river pilot, while her captain stood idly by and watched. To us it seemed as though something was wrong, when a vessel whose only possible use is scouting had to employ a pilot to get from her home berth to the sea, the only place where she can be of any value to her country, and we could not help wondering how her officers were acquiring the experience necessary to handle her in an enemy's waters with the usual aids to navigation possibly destroyed if they were delegating that work to others when in their own waters.

It has been said in defense of this

situation that the pilots' association is so strong that it has forced the adoption of this practice. If such is the case, it is high time to cease paying tribute to any association, especially when such tribute is at the price of the proper training of her own officers. In my judgment, the watch officers of every ship should prepare for and pass the regular government pilot's examination covering the waters surrounding his own yard so as to be prepared to take his ship from the navy yard to sea either by day or by night without outside aid. The training would be excellent and some day might be of the greatest importance.

Economical Operation

One cannot help but be impressed by the earnest desire of an efficient and economical operation of the fleet at sea which is apparent on every hand, and by the fact that in the main this is highly successful. When he turns, however, to that part of the navy which is ashore and attempts to judge it according to sound business principles, he cannot help but feel that the present system is radically wrong. The people of this country have an immense amount of money invested in navy yards, most of which are small and are of little real value from the standpoint of the modern fleet, but two or three of which are immense manufacturing establishments doing several millions dollars worth of business a year. These yards are handled by officers who are detailed for a period not to exceed two years, and who can only regard their stay there as a small part of their real work.

If any one of our naval militia officers who has been a successful business man were to assert that he was capable of taking command of the Atlantic fleet or of one of the big battle ships and of handling it efficiently and economically, he would promptly be assigned to the asylum for the incurable, but our present system assumes that a naval officer, who has absolutely no business experience, whose real training, as a matter of fact, is unfitting him for manufacturing work, can take charge of a large plant, like the New York navy yard, can operate it in competition with highly efficient industrial plants, and at the end of 18 months or two years can go back to sea, turning his plant over to a successor likewise unqualified with himself, if a great steel plant or private shipbuilding company were to change its manager and all of its high executive officers at least once in two years, its failure would be considered absolutely assured; but,

if in addition to this, it picked out for these constantly changing positions men who had no actual experience, not only in the line of its own operation, but in any manufacturing business whatsoever, its folly would make it the laughing stock of the business and commercial world. Under such conditions it is no wonder that ships like the Florida and New York, built in government yards, cost from 15 to 35 per cent more than sister ships built in private yards. It is hard to see how any one can fail to realize that the handling of great plants of this kind is a life work for able men and not a sort of recreation for officers who wish to be relieved of sea duty. These yards should all be in the hands of men whose success or failure should absolutely depend upon making the yards highly efficient industrial organizations, even though they are government owned, organizations in which their owners, namely, the citizens of the country, receive at least a dollar return for every dollar invested.

Range of Government Plants

No one can view with anything but alarm the apparent desire to increase the range of such government plants to make them include the making of armor and the furnishing of powder, not only because of the increased cost due to inefficient management, but of the far graver danger in time of actual need. Military men are constantly talking of the necessity of having a reserve of men trained for fighting. Some of them seem to forget the equal necessity of having commercial institutions trained for furnishing fighting material, which under modern conditions is even more important. A government armor plate plant or powder factory, of a size to be anywhere near economical in times of peace, would be woefully inadequate in times of war. We boast of being a great manufacturing nation, and to me it would seem as though the only wise course would be to make every armor plate plant, every powder factory, every manufacture of small arms, a sort of reserve, so that in time of need we could take advantage of our splendid manufacturing strength, and the way to do this is not by taking away government work in time of peace and making it in government shops, but rather by spreading it around among as many private plants as possible to stimulate them by so doing to keep abreast of modern needs and to be ready in time of stress to render the aid to the country which would be absolutely indispensable to its success. It is only fair to say that, in my

judgment, these conditions are realized by the majority of our naval officers, and that they exist in spite of their judgment and in spite of their desires. The greatest drawback to an efficient navy in this country is the politician who masquerades under the name of "Senator" or "Representative", who knows nothing about the navy and doesn't care enough about it to inform himself and whose concern is not for the welfare of his country, but for his ability to get sufficient votes to return him to Washington at the next election. Her greatest need is a more intelligent interest in her by the citizens of this country, the men who own her and are paying for her support; a clearer and a more interested conception by the business men and the citizens of the country of her ideals and aspirations, of the character of the men and the officers who man her ships, of the work they are doing, of their splendid successes in many lines and of their shortcomings in a few; of a clearer realization of the fact that this is the navy of the hills and the prairies and the cities of the interior as well as of the coast line, that it is the first arm of our defense, the arm that must always stand between us and the warring powers on the other side of the world—an institution whose welfare is too sacred to the nation as a whole to allow its efficiency to be constantly menaced by a political Congress. I am not arguing a big navy, but for a highly efficient one, for one in which the splendid progress of the last ten years may not be halted. As a business man who has had an opportunity of seeing into the very heart of the fleet, I know that our people can be justly proud of the officers and men who wear our uniforms upon the water, of their energy, their ability, their conscientious endeavor to do the work that is before them and of the excellent manner in which they are acquitting themselves in both their everyday work and in the emergencies that from time to time confront them, and I feel that if this high efficiency is ever changed, the fault will lie, not with the navy itself, but with those conditions which it is unable to control, but which nevertheless controls it.

Steamer Medina

The steamer Medina, the second of the two boats for service between gulf and northern ports, building for the Mallory Line, was launched at the yard of the Newport News Ship Building & Dry Dock Co., Newport News, Va., recently. The Medina, a sister

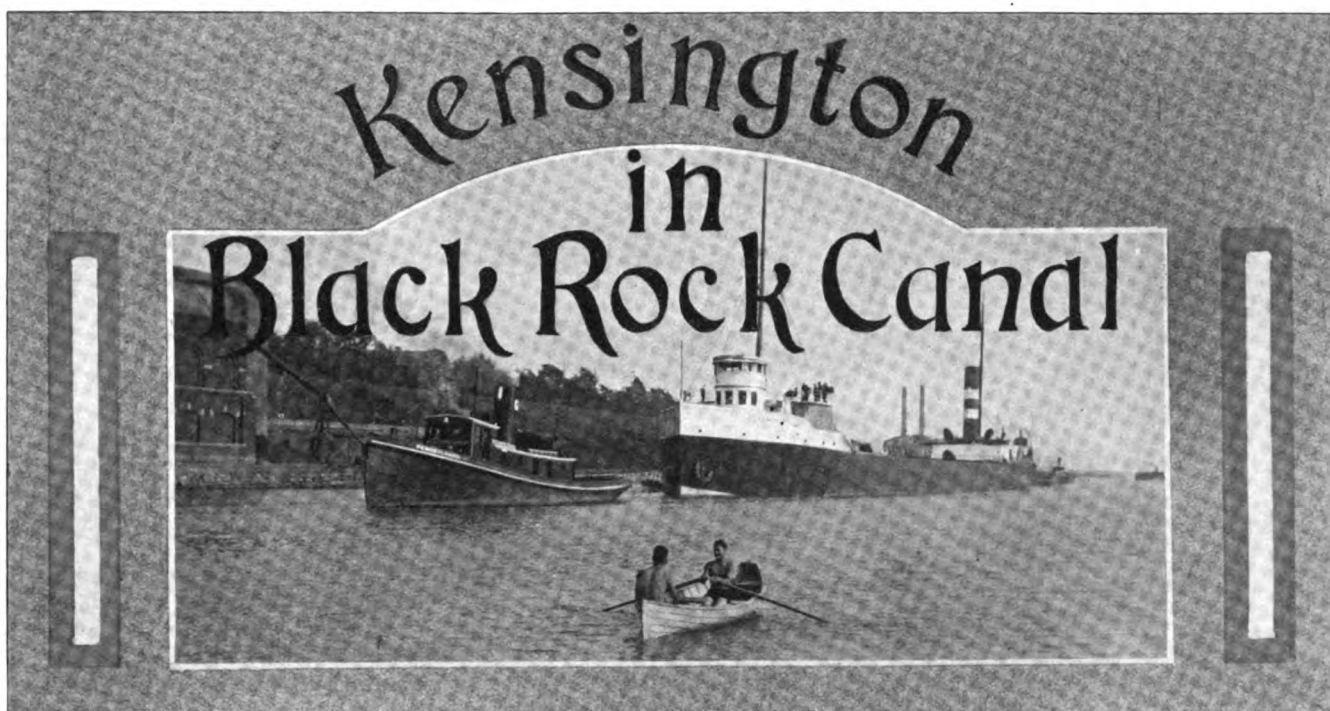
ship of the Neches, is 420 feet long, 54 feet beam and 33 feet 9 inches deep. They can carry 6,600 tons dead-weight cargo and have a draught of 24 feet loaded. They are fitted with single-screw, triple-expansion engines, developing 4,000 horsepower. The cargo holds and decks are mechanically ventilated by air ducts and electric fans, and are especially equipped for the transportation of perishable cargoes, vegetables, fruit, etc., in addition to which the freight decks are equipped with electric lights throughout to facilitate the working of cargoes at night.

Change in Battleship Ownership

The Turkish battleship Sultan Osman, which has been taken over by the British admiralty, is the ship originally ordered by Brazil from Sir W. G. Armstrong, Whitworth & Co., Ltd., Elswick, and named the Rio de Janeiro. She had just completed her contract trials prior to being taken over. The vessel is 637 feet in length, 89 feet in breadth, and on a draught of 27 feet displaces 27,500 tons. She carries 14 12-inch guns and 20 6-inch guns, with a number of smaller weapons. The armor on the broadside, as well as on the barbettes, is 9 inches thick, while the 6-inch guns are protected by 6-inch armor. The machinery, which was constructed by Messrs. Vickers, Ltd., at Barrow-in-Furness, is of the Parsons turbine type, while the boilers are of the Babcock & Wilcox type. During the "continuous cruising speed" on the measured mile, the engines were required to develop 24,000 horsepower, and this it was anticipated would give the ship a speed of 20 knots. The power was easily exceeded, and the mean speed on the measured distance was 20½ knots. This rate was continued for eight hours, and for the succeeding 20 hours the speed was 20 knots. The full-power trial consisted of six runs over the measured mile. It was anticipated that, with the designed power of 32,000 shaft horsepower, a speed of 22 knots would be realized. Again the power was easily exceeded, and the mean speed over the measured course was 22.52 knots.

The New York Ship Building Co., Camden, N. J., has received contract from the Carpenter & O'Brien Co., of Jacksonville, Fla., for the construction of a steamer capable of carrying 3,000,000 feet of lumber and to cost \$440,000.

The three-masted schooner Albert H. Willis, building for Rogers & Webb, Boston, Mass., by F. S. Bowker of Phippsburg, Me., is about ready for launching. She will be commanded by Capt. F. P. Hardy.



THE STEAMER KENSINGTON WAS THE FIRST VESSEL TO PASS THROUGH THE BLACK ROCK CANAL

THE Black Rock ship canal at Buffalo was opened to commerce on Aug. 17. Several test passages by large lake vessels were made before the waterway was opened to navigation. The first vessel, the Kensington, bound down (north), on Aug. 7, with a cargo of 5,200 tons of iron ore. Six other large vessels, ore laden, made test passages between Aug. 7 and Aug. 16, the largest being the Wickwire Jr., 525 feet long, with a cargo of 9,029 tons of ore. This work has been under construction since 1908.

The Lake Erie entrance to Black Rock waterway is by channel, 400 feet wide and 22 to 23 feet deep at mean lake level from the outer Buffalo harbor at north entrance to the northerly end of Erie basin, and by branch canal 1,920 feet long, 500 feet wide and 22 to 23 feet deep at mean lake level; thence northwesterly to the head of Black Rock canal (harbor) opposite the foot of Maryland street, Buffalo.

The Black Rock waterway consists of a canal in which the Erie canal is incorporated, 3.2 miles long, 200 feet wide and 23 feet deep at mean lake level, from Lake Erie at the foot of Maryland street, Buffalo, to Black Rock lock at the foot of Amherst street Buffalo; thence from Black Rock lock, chamber 650 feet long, 70 feet wide, 24 feet depth of water on sills with 5 feet lift of lock; thence channel in Niagara river 3.3 miles long, 400 feet wide, 23 feet deep to the natural deep water harbor 5 miles long, 1,600 to 2,000 feet wide and 23

feet to 32 feet deep, to Tonawanda, N. Y.

Practically all of the channel excavation from Lake Erie to Ferry St. bridge was in bedrock, which was drilled by steam drills on drill boats and blasted with dynamite before excavation by dipper dredges. The remainder of the channel excavation was nearly all in clay and gravel and sand except across Strawberry Island Reef in Niagara river, which was in bedrock for 3,000 linear feet of channel.

The lock is composed of concrete walls and miter sills founded on bedrock with horizontal girder, single skin steel lock gates swung by submerged steel cables operated by electric motor-driven winding drum operating machines. There yet remains the completion of the timber crib, concrete guide pier and extension of the west lower wing wall, which is under construction by contract, the filling in of lock grounds, construction of permanent gate operating houses on the lock to replace the temporary wooden houses now in use, the construction of an office and storage building and general minor improvements on both the channel and lock. The total estimated cost of the Black Rock waterway is \$4,500,000.

It was necessary in order to make the waterway available for the largest lake vessels to replace the old Erie canal swing bridge at Ferry St. by a modern bridge. The new bridge is a steel Strauss single lift bascule with 150 feet clear channel openings. The

clear height under the bridge when closed is 15 feet to correspond to the bridge clearance of the New York State Barge Canal. The great operating machinery, pumping plant and capstans at the lock, and the bridge operating machinery, are all driven by Niagara Falls electric power. Lackawanna steel sheet piling, manufactured by the Lackawanna Steel Co., Buffalo, was used in the construction of the cofferdam for the ship lock. The contractors concerned in building the canal were the Great Lakes Dredge & Dock Co., the Buffalo Dredging Co., McArthur Bros. Co., and Oiler Engineering Co.

The rules and regulations which have been prescribed for navigation through the canal are as follows:

1. The term "Canal" when used in these rules will mean all of the Black Rock Waterway, including Ferry Street Bridge, Black Rock Lock, and all of the lands, piers, buildings and other appurtenances acquired by letters patent from the State of New York, or constructed for the use of the waterways; the southerly limit thereof being at the end of Bird Island Pier, and the northerly limit being at the downstream end of the Guide Pier, Black Rock Lock; a length of 3.7 miles.

2. The canal and all of its appurtenances and the use, administration, and navigation thereof, shall be in charge of the officer of the corps of Engineers, United States army, assigned to that duty by the Secretary of War, or his authorized agents.

3. The movement of all vessels, boats, or other floating things in the



BLACK ROCK CANAL APPROACH

canal, shall be under the direction of the authorized agents of the engineer officer in charge, and their orders and instructions must be obeyed.

4. For passage through the canal, vessels or boats belonging to the United States government shall have precedence over all others.

5. All registered vessels or boats must pass through the canal in the order of their arrival at the canal limits.

6. No vessel of 100 gross tons or over shall navigate the Black Rock Canal at a rate of speed greater than five statute miles per hour. This rate of speed will require elapsed time to navigate between designated points, as follows:

From south canal limit to Ferry Street bridge, 22½ minutes; from Ferry Street bridge to International bridge, 13½ minutes.

7. No vessel shall pass or approach within ¼ mile of a vessel bound in the same direction in the canal. Tugs without tows and boats under 100 gross tons are exempt from this rule.

8. No tow shall enter or pass through the canal with a tow line more than 400 feet in length.

9. No vessel or boat shall anchor in or moor along the canal within the limit of any portion of the 23-foot channel; and no business, trading, or landing of freight or baggage will be allowed on or over the canal lands or structures, except such articles as may be readily carried in the hand, without the permission of the engineer officer or his agent.

10. No person shall throw or cause the discharge of any solid material of any kind into the canal, nor shall any vessel's or boat's boiler flues be cleaned while in the canal.

11. If any vessel, boat or other craft sinks or grounds in the canal, or in any other manner delays or obstructs navigation through the canal, the engineer officer in charge, or his agent, shall have the right to take possession of such vessel, boat or other craft and to remove it, as may be necessary to clear the obstruction caused by it; and no person shall do anything that will, or tend to, prohibit, or interfere with, his doing so.

Ferry Street Bridge

12. The clear headroom under Ferry Street bridge is 15 feet at mean water level, which level is indicated by the zero of the gages on the bridge pier and west abutment. The times required to lift the bridge is 1½ minutes.

13. All vessels and boats which cannot pass under the bridge shall reduce

speed on approaching the bridge sufficient to enable them to come to a dead stop, without touching the bridge, in case the movable span cannot be lifted. If the wind is dangerously strong, passage of the bridge shall not be attempted by large vessels without the aid of a tug or tugs.

14. Vessels and boats bound down (north) shall have the right of way and passage through the bridge over those upbound (south).

15. All vessels and boats desiring passage through the bridge shall signal therefor by one long and two short whistle-blasts.

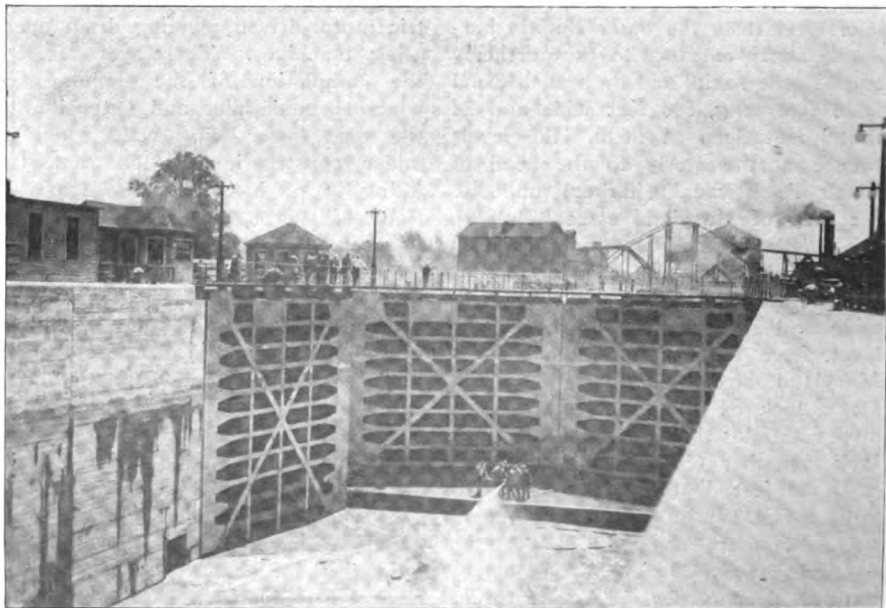
16. Upon receiving the opening signal, the bridge operator shall answer by giving the same signal on the bridge whistle and he shall then proceed at once to lift the bridge.

17. In case the bridge cannot be lifted, for any cause, the bridge operator shall answer a vessel signal by giving five short whistle blasts; and the vessel shall then be stopped until the bridge is ready to be lifted, when the bridge operator shall give the whistle signal for passage and the vessel may proceed.

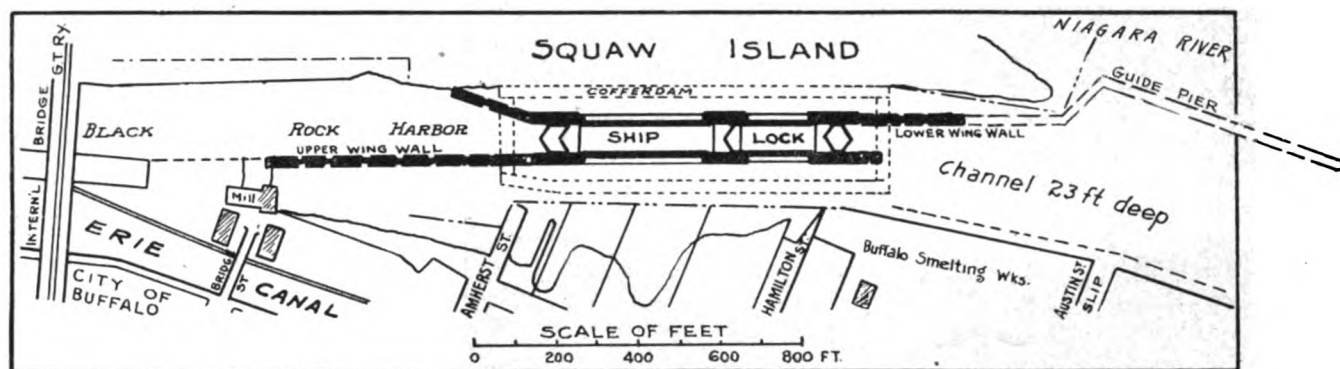
18. In case the bridge is disabled so that it cannot be lifted for one-half hour or more, pending repairs, red flags shall be displayed on the bridge in day time and two red lantern lights, one above the other at night; and when such signals are displayed no vessel or boat shall signal for or attempt passage through the bridge.

19. Bridge operators shall not close the bridge against a vessel or boat desiring to pass through it, until foot passengers or vehicles have been delayed at least 15 minutes by the bridge being open for such vessel's or boat's passage.

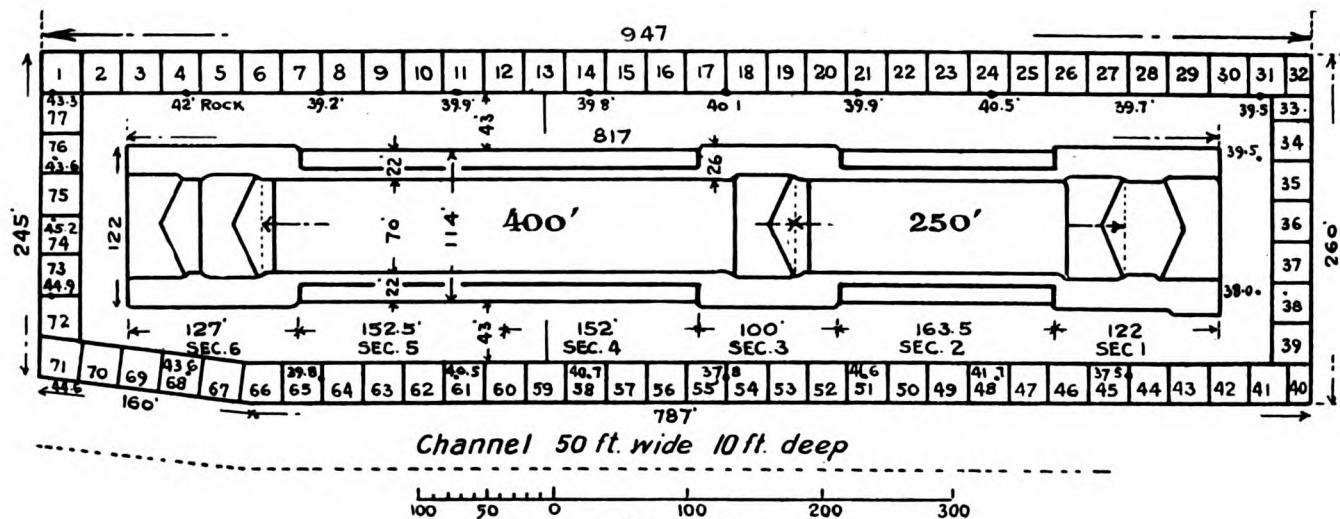
20. No foot passengers or vehicles



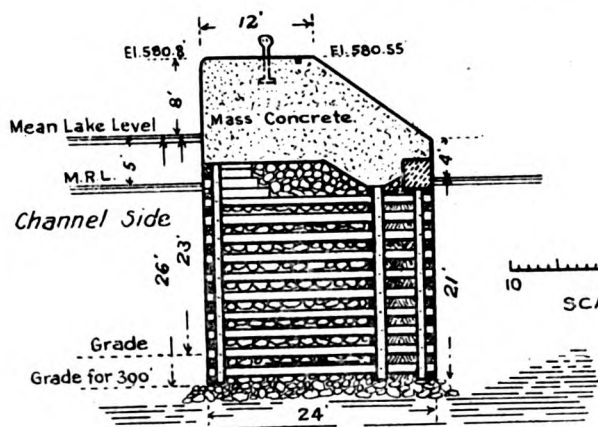
BLACK ROCK LOCK. UPPER GUARD GATES CLOSED AND LOCK UNWATERED



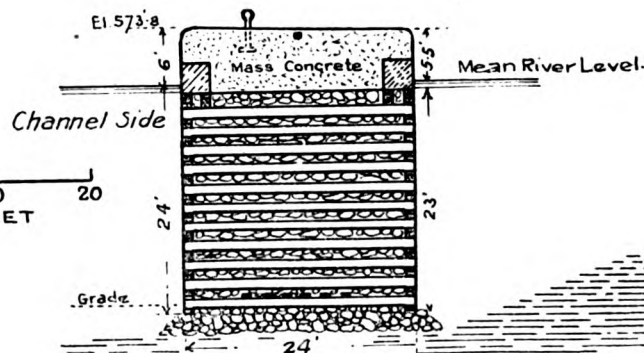
LOCATION PLAN



GENERAL PLAN OF LOCK AND COFFERDAM

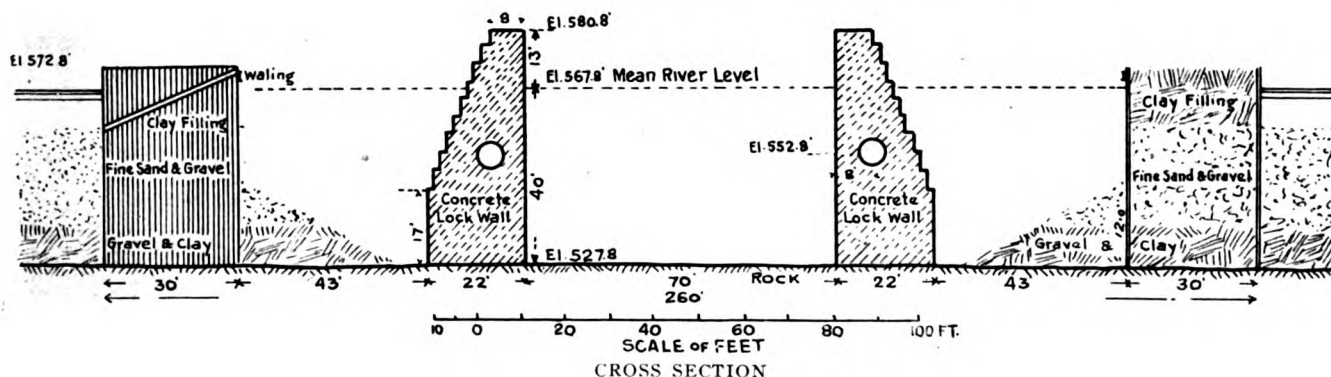


CROSS SECTION OF UPPER WING WALL.

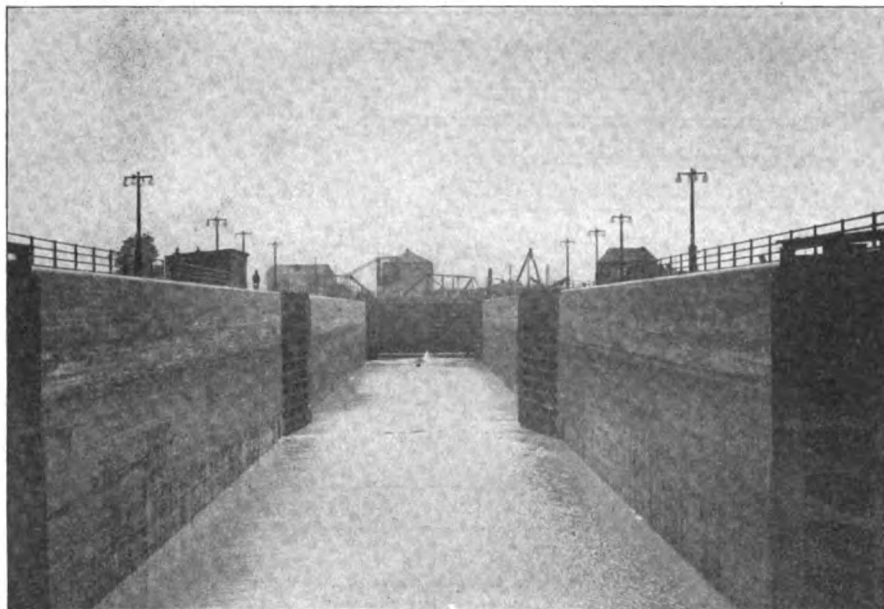


CROSS SECTION OF LOWER WING WALL.

CROSS SECTION OF WING WALLS



CROSS SECTION



BLACK ROCK LOCK LOOKING SOUTH FROM LOWER GATES

shall stop or stand on the bridge at any time.

21. No person shall pass on foot or drive a vehicle past the guard gates at either end of the bridge when they are down or being lowered.

Black Rock Lock

22. All vessels and boats desiring to use the lock shall signal for the same by two long and two short whistle-blasts.

23. No person in charge of a vessel or boat coming from above shall bring it within 300 feet of the upper lock gates until they are made ready for vessel entrance and he receives directions to enter, from the lockmaster in charge.

24. No person in charge of a vessel or boat coming from below shall bring it within 200 feet of the lower lock gates until they are ready for vessel entrance and he receives directions to enter from the lockmaster in charge.

25. Small vessels or craft, such as row, sail, and motor boats, etc., bent on pleasure only, shall not be granted a separate lockage, but will be passed through the lock in company with vessels; or together in one lockage on the hour if downbound, and half past the hour if upbound. Vessels and other large boats when in the lock shall fasten one head-line and one spring line to the snubbing posts on the lock walls, and the lines shall not be cast off until the signal is given by the lockmaster for the boats to leave the lock.

26. Vessels and boats will be passed through the lock in the order of their arrival, except that the representative of the engineer officer may order a small vessel to lock through in com-

pany with another vessel, irrespective of the former's order of arrival.

27. All vessels and boats shall be maneuvered with great care so as not to strike any part of the lock walls, or any gate or appurtenance thereto, or machinery for operating the gates, or the walls protecting the lock approaches. They shall be free from projecting irons or rough surfaces that would be liable to damage the lock and they must be provided with fenders to be used in guarding the lock walls, etc., from injury.

28. Vessels and boats shall not enter or leave until the lock gates are fully in their recesses, and the lockmaster has given directions for starting.

29. Upon each passage through the lock, masters or clerks of all vessels or boats (except small motor boats and

pleasure craft) shall report to the lock office, a statement of passengers, freight and such other statistical information as may be required by the blank forms which are issued to them for the purpose.

30. Trespass on lock property is strictly prohibited.

Henry Breckenridge,

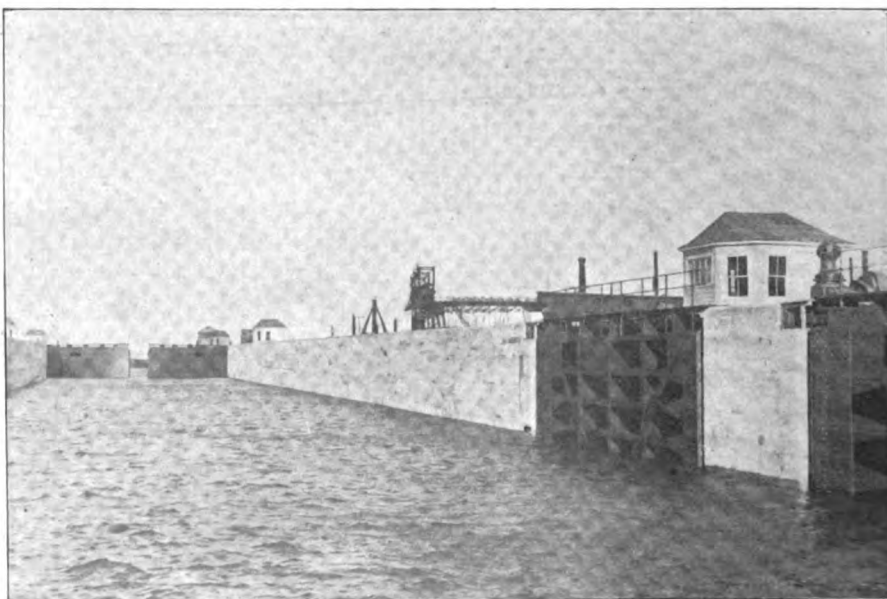
Assistant Secretary of War.

War Department, July 3, 1914.

W. R. Grace & Co. have announced rates on lumber from the Atlantic to the Pacific coast through the Panama canal by the Atlantic & Pacific Steamship Line. The rates are \$13 per 1,000 board feet for 30-foot lengths and less, \$14 for lengths from 30 to 40 feet, and \$17 for lengths from 40 to 50 feet. The \$13 rate represents a reduction of \$4 from the rate via the Straits of Magellan.

The Union Iron Works, San Francisco, Cal., recently launched a huge caisson for use in repair work in the locks of the Panama canal. This structure will be equipped with four vertical shaft, electrically driven, centrifugal pumps with a pumping capacity of 10,285,000 feet in 24 hours. This caisson is 113 feet 10 inch in length, 65 feet deep, 36 feet wide and weighs 4,176,327 pounds.

The Newport News Ship Building & Dry Dock Co. was the lowest bidder for the construction of two new revenue cutters for the government, bidding a total of \$396,000 for the two vessels, to be completed within ten months. This bid was \$49,700 lower than the next lowest.



BLACK ROCK LOCK LOOKING TOWARDS NIAGARA RIVER

Water Supply Aboard Ship

*Letters from the Masters of the Erie Railroad Lake
Line Showing the Efficiency of Separate Connections*

IN THE March MARINE REVIEW we presented a comprehensive plan for the safeguarding of water supplies aboard lake ships which had been worked out by the management of one of the railroad lines and which, at least as regards the areas from which supplies are to be taken, has been adopted by the Lake Carriers' Association.

It is now pretty generally known that the line referred to is the Erie Railroad Lake Line, and the MARINE REVIEW recently addressed an inquiry to the management as to the working of the system which has brought forth the following interesting letters from the officers of the ships of the fleet which have been in commission this season. These letters certainly speak volumes in appreciation and the freedom from sickness resulting from the adoption of the system, as compared with former years, fully justifies all the efforts put forth.

It will be borne in mind that the methods employed, in addition to prescribing carefully worked out safe areas, include entirely independent sources of supply and means for distribution as well as for sterilizing sea-cocks and tankage. Moreover, in order that no possibility might exist of drawing drinking water from a possible contaminated supply, the entire tankage, supplying not only exclusively drinking and cooking water, but baths and lavatories as well, is filled from the same source. Toilets are supplied from an entirely separate closed system which has no other outlets.

The management advises that the shortage of tankage referred to in the case of one ship has been already rectified. That the example set by the Erie line, now that it has been proven a success, will be extensively followed may be taken for granted.

July 18, 1914.

Dear Sir:—

Replying to yours regarding water supply have to say that the tanks on this ship are ample with one exception, that is, the one which supplies the bath and lavatories in firemen's and deckhands' house. This should be larger to avoid taking water at other times than when the rest of the tanks are filled.

As to the value of the system; it is inestimable. Our supply is now taken altogether on Lake Huron crossing Saginaw Bay and on Lake Huron on the course between Pt. Betsey and Milwaukee with the result that our table water looks equal to any filtered or bottled spring water furnished to the trade. I attribute a goodly proportion of this to the independent sea-cock and hose system installed last winter in this line.

Yours respectfully,

CHAS. D. ROSS,

Master, Str. F. D. Underwood.

July 18, 1914.

Dear Sir:—

In reply to your letter with reference to the fresh water system will say, that if carried out, it will, in my opinion, always stand as one of the greatest improvements ever made aboard ship, as regards the welfare of the personnel. I am not well enough informed to know the causes of cramps, diarrhoea, typhoid, etc., so often prevalent, but it seems to me that with the provision now made for pure drinking water, they cannot at least be attributed to that source.

One of the conditions which I believe might well be applied to the "Safety First" movement is personal cleanliness, both internally and externally, and the opportunity for such. With the present method of providing and caring for drinking water, this company has certainly made a long step in advance, in that particular, towards "Safety First".

The supply on this ship is ample for all purposes with ordinary stays in port with the exception of the firemen's and seamen's bath. Their tank is too small for the number of men served. An improvement could be made in the tank covers and service pipes.

Yours truly,

AUG. NAGELVOORT,

Chief Engr., Str. F. D. Underwood.

July 18, 1914.

Dear Sir:—The system for supplying drinking water on this ship is a great improvement for the reason that it is independent of everything else and gives us water as pure as it can be had. The tankage is ample for all needs and cannot be any better.

Yours truly,

John C. Clarke,

Master, Str. Delos W. Cooke.

July 17, 1914.

Dear Sir:—

Regarding fresh water supply. Our tanks are ample for about four days in port. The water is always pure. The system works O. K. and is all that

could be desired to insure pure water for drinking and cooking purposes.

Yours truly,

CHAS. R. OGG,

Chief Engr., Str. Delos W. Cooke.

July 26, 1914.

Dear Sir:—

The fresh water supply on Str. Brownell is as near perfect as is possible to obtain without filtering or distilling, which, with our source of supply would not improve the water any.

We have sufficient tankage to last eight days in warm weather. We fill our tanks on Lake Michigan westbound and on Lake Huron eastbound, but take no water from Lake Erie.

Yours truly,

C. W. WATSON,

Master, Str. Geo. F. Brownell.

July 26, 1914.

Dear Sir:—

Regarding fresh water system installed in this ship last winter would say that the conditions are greatly improved both in quality and quantity. The water is clear and as pure as I have ever used or seen, and on trip two the tanks were filled on Lake Huron eastbound and lasted until we got back to Lake Huron again, having been in Buffalo four days and stopping at Fairport both ways, making nearly eight days.

There has been no sickness this year so far and that alone is proof of better

water than we have had in previous years.

Respectfully yours,
L. A. BRADSHAW,
Chief Engineer, St. Brownell.

July 21, 1914.

Dear Sir:—

Referring to the fresh water supply on Owego I beg to advise you that our new system is giving the best of satisfaction. With the addition of our new tanks we are able to carry from ten to twelve days' supply which enables us to take our supply from the very best waters of the lakes. I feel that our system is a great improvement over the old method of filling tanks. And this line has taken a step in advance of all other lines in safeguarding against impure water.

Yours truly,
GEO. W. MOORE,
Master, Str. Owego.

July 22, 1914.

Dear Sir:—

In regard to our fresh water supply and tank capacity of Owego, I must say it is a big improvement over the old method of supplying and keeping water.

I know positively that by using the same pump and sea cock for general service and for filling tanks that in places like Buffalo, Milwaukee, Cleveland or Chicago, where you have occasion to use the same pump it cannot be kept in a sanitary condition as it handles more or less oil, sewage and other impurities from the harbor, which will adhere to pipes, valves and even more so to the rubber hose, which is more or less harmful to the crew.

So with these improvements I know conditions will be more healthful, as I have often noticed an oily taste in the water, and as it could not have come from midlake it must have lodged in the pump, pipes or hose because of using the pump in port.

As to tank capacity I should judge we could keep a supply for 12 to 14 days which is more than enough for any conditions.

Yours truly,
IRVIN A. FRANCOMBE,
Chief Engineer, Str. Owego.

July 23, 1914.

Dear Sir:—

I think the system installed for filling tanks for drinking and cooking purposes is as near perfection as possible. I think the supply would last about ten days.

Yours truly,
W. M. COTTRELL,
Master, Str. G. A. Richardson.

July 27, 1914.

Dear Sir:—

In reply to your letter regarding the fresh water system will say it is the purest and most sanitary system yet installed on any lake steamer. I think the tanks would last at least eight days.

Yours truly,
W. R. BURTON,
Chief Engr., Str. G. A. Richardson.

Buffalo, July 28, 1914.

Dear Sir:—

In reply to your inquiry relative to fresh water system installed on Steamer McCullough, I wish to say to you that I consider it an acquisition and should be installed aboard all Great Lakes craft.

I have observed very carefully the working of the system during our experience with it and find the fresh water supply on McCullough much finer than I have seen in years. A good proof of this is that I have not opened my medicine chest since we started out this spring. Furthermore, I think it is a matter for the steamboat inspection service to take up and make compulsory.

The endurance of our fresh water supply is about eight days in port at this time of year.

I feel that the crews of the line are much indebted to you for the instituting of the system. I am, very truly,

Yours,
JOHN C. HEANEY,
Master, Str. McCullough.

July 27, 1914.

Dear Sir:—

In reply to your letter regarding fresh water supply. The system works satisfactorily and furnishes an abundance of pure water. There has been no sickness among the crew, especially the firemen, during the hot weather.

Yours truly,
W. H. SHELDON,
Chief Engineer, Str. McCullough.

July 20, 1914.

Dear Sir:—

In reply to your letter would say that I have not had much opportunity to try out the fresh water system because of ship going into ordinary but from what experience I did have with it am sure that it is a fine thing and every steamer on the lakes should have a system of the same kind. Our present tankage is good for about five days in port.

Very truly yours,
ROBERT B. WILKINSON,
Master, Str. Binghamton.

July 22, 1914.

Dear Sir:—

Regarding fresh water system in-

stalled on Str. Binghamton I did not have much time for observation because the ship was laid up. The tanks hold about six or seven days' supply with full crew. We had water in the tank about ten days and there was no evidence of any scum or impurities in that time. I believe it to be an improvement that should have been made long ago.

Respectfully,
CHAS. E. ROBINSON,
Chief Engineer, Str. Binghamton.

Why Did She Sink?

It cannot be said that naval architects have yet obtained very much information from the Empress of Ireland inquiry that will help them to construct ships capable of keeping afloat after being struck as that vessel was. One of the examining counsel asked a witness if he knew why the vessel sank. The question was too simple to require more than the smile which the witness gave in reply, and the gentle rebuke of Lord Mersey when he said that he thought they could all answer that question. But later Lord Mersey himself declared that up to that time the evidence had completely failed to show why the vessel sank. Apparently only two of the watertight compartments had been flooded, and so she should have kept afloat. Percy A. Hillhouse, the naval architect to the Fairfield Co.—who built the vessel—stated that she ought not to have sunk if only two compartments were flooded. But she did sink. And if the cause of her sinking is not made clear the whole theory of ship designing will be left in a condition of confusion. She did not sink because she was rammed by the Storstad, but because, as a result of that ramming, too much water obtained access to her holds. If only two compartments were torn open naval architects have been all wrong in their calculations, and all other large liners now afloat are as unsafe as sad experience has proved the Empress of Ireland was. If, on the other hand, the vessel received more damage than comes out in the evidence, the naval designers may yet be vindicated. If the matter is not cleared up it will be a very awkward business altogether.—Fair-play.

Mitchell Davis & Son, Solomons, Md., is building a wooden tug for P. Sanford Ross Co., of Jersey City, N. J., to be 75 feet by 18 feet by 7½ feet. The machinery of the tug Violette will be installed in the new hull but a new boiler will be built.

Diesel Power Boat Pointer

*The First Small Boat to be Fitted With a Diesel
Engine in the United States—A Cheap Prime Mover*

THE Pointer, a service boat belonging to the Maryland Steel Co., Sparrow's Point, Md., is undoubtedly the first small Diesel-powered boat in America. It is interesting to note that this whole outfit, including the hull and engine, were designed and built in the United States.

The Pointer was designed and built as a service work boat, to be operated by the owners in the harbor of Baltimore for towing and carrying freight. For this service it was necessary to have a heavy duty engine that would be efficient in towing, and also an engine that would operate at a minimum cost. How well the Fulton Diesel engine fulfills these require-

such heavy construction equipped with only 50 horsepower.

The engine has proven easy to start, and very simple in operation. It has been running on asphaltum base fuel oil, with a specific gravity of 0.844, the flash point 181 degrees, and burning point of 225 degrees, and 37 degrees Baume. The British thermal units per pound were 19,730.

While the makers of the engine guarantee a fuel consumption not to exceed 0.55 pound of oil per horsepower per hour, the test showed considerably better economy than this, as the engine when running under full load consumed $3\frac{1}{4}$ gallons of oil per hour. This oil cost 3 cents a gallon, delivered, making a total cost for op-

accompanying cut will give a very good idea of the general outline of the engine. The Fulton Diesel engine is of the full Diesel type, operating on the four-stroke principle. There are no hot bulbs or hot heads to heat before starting, as the engine will start instantly on air. The engine has three working cylinders, with bore and stroke of 8 x 9 inches. The fly-wheel is placed on the after end of the engine, between the engine itself and the reverse gear, the air compressor being driven by the main crank shaft on the front end of the engine.

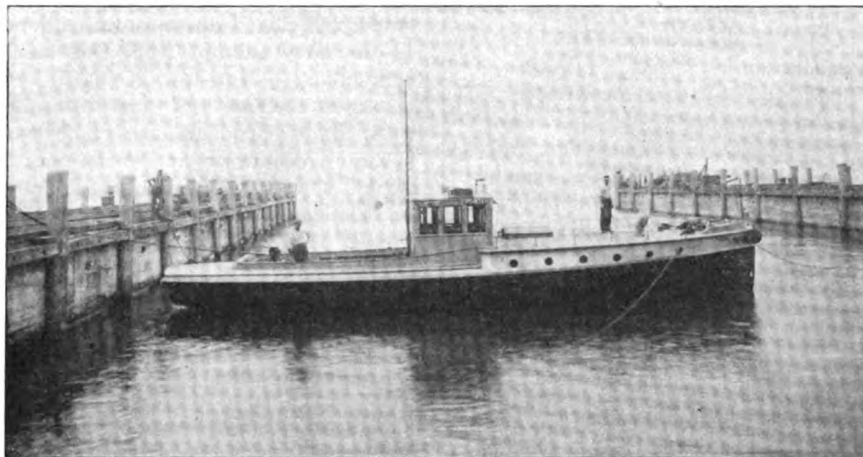
The Fulton Diesel engine is non-reversible, the maneuvering being done with a mechanical reverse gear, which greatly simplifies the engine, and makes it much easier to operate. It is interesting to note that the Pointer when running at full speed may be stopped dead in just 20 seconds, and may be brought from full speed ahead to full speed astern in 60 seconds. This allows the boat to be handled to very good advantage and is as quick as a reversible engine would be, if not quicker, and more reliable.

The oiling system is especially worthy of note. It is of the circulating pressure type, the oil being pumped through a hollow crank shaft to all bearings and wrist pins under 15 pounds pressure; it then drains to a pocket in the base, where it is filtered, cooled by the water intake, and used over again.

The engine is very clean and quiet in its operation; there is no smoke or smell to the exhaust; there is no objectionable odor of any kind on the boat. This is a great advantage over the hot bulb type, which smokes and smells very badly.

Anyone wishing information on the Fulton Diesel oil engine should write to the Fulton Mfg. Co., Erie, Pa.

Plans have been approved for the three new battleships California, Mississippi and Idaho, authorized by Congress, and bids for their construction will be opened in October. The general dimensions of these vessels will be 624 feet by 97 feet by 30 feet, with displacement of 32,000 tons. Their main armament will consist of 12 14-inch guns, four submerged torpedo tubes, and 22 5-inch rapid fire guns.



POINTER, EQUIPPED WITH FULTON DIESEL ENGINE

ments is shown by the results of one of the tests made.

The Pointer is a 54-foot x 12-foot 4-inch boat, drawing 4 feet 2 inches of water, and having a displacement of 20 tons. The engine is placed just forward of amidships under a hatch, the controls being carried up to the pilot house.

The engine installed is a three-cylinder 50-horsepower Fulton Diesel, having a bore and stroke of 8 x 9 inches, and the normal speed is 400 revolutions per minute. That this engine develops its full rated horsepower is shown by the fact that it swings a 38 x 38-inch three-blade propeller at 400 revolutions per minute.

The speed attained by this boat is really remarkable, it showing a speed of 10.4 miles, which is very good for a boat of this size and of

erating the 50-horsepower engine per hour of a little less than 10 cents. This is very cheap when compared with steam or gasoline engines. The test showed that the engine consumed 0.4576 pound of oil per horsepower hour, which is very much less than the guaranteed economy.

A small auxiliary air compressor for use in emergency for starting is placed in the engine room. This compressor outfit was designed and built by the Fulton Mfg. Co., and is driven by one of their 4-horsepower, self-sparking gasoline engines. This little compressor outfit is capable of pumping air into the bottles up to 800 pounds pressure, and will fill a bottle from atmospheric pressure up to 800 pounds in 25 minutes.

Some details of the Fulton Diesel engine will be interesting, and the

An Open Letter

In Which Secretary of the Navy Josephus Daniels May See Himself As Others See Him

WASHINGTON, D. C., Sept. 1, 1914.

My dear Mr. Daniels.—

I wonder whether you realize that you are manager of a great industrial concern, representing an investment of hundreds of millions of dollars, with a payroll of over a hundred thousand names; and I also wonder whether you actually know what product that concern was established to turn out? There is nothing in your official acts and utterances, so far as I am aware, to show that you realize the one or know the other. If there were, I should not be calling your attention at this moment to the navy as a vast factory or to its product, "Battle Efficiency".

Your Experience and Capacity

It might be unkind to inquire into your experience and the capacity you have already displayed in managing similar immense combinations of capital and labor, yet, were these questions asked there might arise in your mind a conviction that it would be wise to move very slowly in introducing innovations and to take no important step unadvisedly. By unadvisedly I do not mean the counsels of those immediately about you who are apt, such is human nature, to suggest only that which they believe will be agreeable to you, but I do mean a consulting of what may be termed "service public opinion". Unfortunately for yourself, you have, like your predecessor, exerted all your power to prevent any expression of this general sentiment by forbidding the open discussion of every professional topic, of whatever description. There are, at most, but a very few matters which in themselves are confidential—such as new devices in ordnance and torpedoes or plans of naval campaigns and actions. No officer, one could almost say no enlisted man, would ever think of discussing such things in public—but omitting these and such other subjects, if any, as may be definitely proscribed by the department, the whole field of naval activity might well be thrown open to debate conducted within the limits of courteous and impersonal treatment. It is a matter of record that an article prepared for the naval institute was forbidden publication on the ground that it divulged important official secrets—

notwithstanding the fact that its every statement was drawn from printed annual reports of the secretary of the navy, freely accessible to whomsoever cared to read them. The result of this policy, past and present, is that the secretary of the navy never knows what the navy at large thinks of any subject, great or small. It would almost seem as if he preferred ignorance to knowledge. Why debar yourself from profiting by this thrashing out of important questions of policy and technique? Possibly its value would at times be small, but occasionally it would be beyond price. And, of course, you are not bound to gov-

Respect of Authority

Unfortunately for you the public cannot readily forget that in your desire to break down the sense of subordination and respect of authority, which is the keystone of naval discipline, you were hardly persuaded to suppress your orders compelling enlisted men, against their will, to mess with their officers; or that a man of your exalted position should have exhibited such astounding misapprehension of the most vital thing in naval life. The public has not for this and other matters visited you with its disapprobation so much as with its ridicule. I need hardly remind one who ought to be familiar with our history that when a man is laughed at he is politically doomed.

ern yourself by these opinions. For what you do you are solely responsible. Rewrite your Navy Regulations, Article 1534, and encourage officers publicly to express their views, over their own signatures, on topics not confidential, and you will never regret your action which *inter alia*, will remove on their part the unpleasant sense of being muzzled and will provide a useful safety valve to now suppressed emotions. Do not fall back on the permission accorded to officers and others to address the department on service matters. All know the futility of this authorization; all know that such communications never meet, or practically never meet, the secretary's eyes. His subordinates do not allow him to see

them, especially when they do not accord with their own views.

Doubtless it may be urged that as every industrial plant turns out, incidentally, certain by-products, so has the navy its by-products. However true this is, it is equally true that the plant which neglects its main for its by-products is well on the road to bankruptcy. Are you quite sure that the navy's by-products do not command the larger share of your thought and attention? To manufacture economically and efficiently is the aim of every manager. Failing in this respect, he is quickly replaced by another with sounder judgment or more ability. This is the law of industrial life. In practice, useless or unprofitable departments are eliminated; whole plants not advantageously located, are closed down and abandoned. Is the navy exempt from this law of economics? Not so, if battle efficiency is the one aim, but grotesquely so if its by-products are made paramount. Whatever action is contemplated should be tested by its effect on battle efficiency. If it is seen to further that end, adopt it at all costs. If its value is problematical, defer its adoption. If it does not contribute unmistakably to that end, reject it without delay or regret. These rules are safe and invariable.

Diverting the Navy's Work

To divert the navy's work, funds or interest to any other cause, worthy or unworthy, whether it be seeking the good will of the labor unions; the operation of useless navy yards; the killing off of private shipyards, armor plants, powder factories; the sudden announcement of new qualifications for promotion; the discouraging of private makers of naval material; are only justifiable when the proof is clear beyond peradventure that battle efficiency is thereby enhanced. Has the latter been your guide in your attitude towards these and similar questions?

One great source of waste is the maintenance of navy yards which do not contribute to battle efficiency. On this point a wise and competent observer, in his "Art of Naval Warfare", lays down the true doctrine in these words:

"The general principle to be followed in the case of dockyards and

similar government establishments is to form and keep them on the smallest scale compatible with real requirements. No portion of the naval expenditure of a country should be scrutinized more closely or incurred with greater reluctance than that devoted to their creation and expansion. Where the resources of a country admit of recourse to private industry, the desirability of permitting an overflow of work from the government establishments to the latter should exert unceasing influence upon naval policy. This leads up to the statement of another principle. The number of government establishments of the kind in question should be kept as small as possible. What is wanted is, not the most we can get, but the fewest that we can manage to do with. This should be regarded as axiomatic."

It is difficult to estimate the saving which an observance of Sir Cyprian Bridge's well founded injunctions would yield. If, in addition, up-to-date methods were employed in the half dozen yards essential to battle efficiency, the resulting economy would amount to tens of millions of dollars annually. Is it not worth while, is it not a duty to work toward this end?

Concentrate on Battle Efficiency

You cannot devote your undoubted ability and great talents to a better purpose than to reducing to a minimum the navy's inescapable by-products and to concentrating all your energies on the one real object, the sole reason for existence of the navy, battle efficiency.

There are ugly rumors current to the effect that not in a generation have politics and politicians been so potent at the navy department as now. You yourself know how true or false these rumors be, and, being told of their existence, can easily put an end to them, proving by acts and not mere denials that they are hideously untrue.

None of your predecessors had a more lively appreciation of the powers inherent in your great office and none was more ready to use them than you are. Like Hosea Bigelow, "I du like a man what ain't afeerd", and so I admire your energy and your fearlessness. Whether I think it wise on your part to check the flow of promotion by declining to accept the resignations of officers, thus keeping disgruntled men in the service to the detriment of its morale and, in so doing, to stimulate the growth of the so-called "hump"; or by opening appointments to the enlisted men to the naval academy to intro-

duce an element of discord among them similar to that which in the 70's wrecked the apprentice training system; or to forbid Jack Tar to spend his own money in the canteen on articles of his choice, through ruling out the proprietary brands he definitely prefers; or to interfere, possibly with ultimate defeat to the nation, with the training of officers and men for actual battle, by turning the former into school masters and the latter into sulky and reluctant school boys, many of whom entered the navy to escape the irksome drudgery of the school, thus rendering the service less popular than it ought to be; or to hold up temperate and hard-working officers to universal contempt by branding them in your recent order as lacking self-control in the presence of tempta-

Killing Off of Private Shipyards

To divert the navy's work, funds or interest to any other cause, worthy or unworthy, whether it be seeking the good will of the labor unions, the operation of useless navy yards, the killing off of private shipyards, armor plants, powder factories; the sudden announcement of new qualifications for promotion; the discouraging of private makers of naval material; are only justifiable when the proof is clear beyond peradventure that battle efficiency is thereby enhanced. Has the latter been your guide in your attitude towards these and similar questions?

tion to drink too much, a wholly unmerited and false accusation, etc., etc., it is bootless to say. Yet I feel sure that a consulting of navy public opinion might have helped you, even if it did not alter your opinion or influence your actions, to a broader view of these matters. "*Audi alteram partem*" is advice as sound as it is old.

It is not an uncommon experience on the part of those who mean well to find that the results of their endeavors differ widely from their expectations. That you counted upon enhancing your reputation by your acts may be taken for granted. Not to believe this would be to insult your intelligence. It is pertinent, therefore, to ask whether and how much you have gained in this respect. While admitting that some of your innovations have been favorably acclaimed by many persons, whose opinions, being based on ignorance or on a

wholly erroneous conception of the nature and extent of the task you have so lightly undertaken, are of no real value, yet an impartial summing up of the pros and cons have largely predominated. Unfortunately for you, the public cannot readily forget that in your desire to break down the sense of subordination and respect of authority, which is the keystone of naval discipline, you were hardly persuaded to suppress your order compelling enlisted men, against their will, to mess with their officers, or that a man in your exalted position should have exhibited such astounding misapprehension of the most vital thing in naval life. The public has not for this and other matters visited you with its disapprobation so much as with its ridicule. I need hardly remind one who ought to be familiar with our history that when a man is laughed at he is politically doomed.

So far as those under you are concerned, one of your temperament and views could not be expected to have for them any particular regard or consideration. To you they are mere pawns on the chess board of your ambitions. None the less, it can scarcely be comforting to reflect that their official happiness varies directly with the square of their distance from you; that a visit on your part to one of your ships in commission is dreaded as a calamity, not to the ship, but to yourself.

It is greatly to be feared that, unless you speedily adopt a new policy, one in accord with the traditions of the service, and its sole aim battle efficiency, you are likely to be remembered chiefly for your follies, which no sadder fate can easily be imagined. This suggestion is not based on malice—far from it, but on a keen and friendly desire to put you right while it is yet time, if indeed there still be time to repair the damage you have done to your own name.

There is no one who credits you more unreservedly with sincerity of purpose or who wishes your administration more brilliant and unqualified success than I, but profound conviction on my part forces me to repeat that it is only by holding fast to the one principle I have quoted and by gaging everything by its effect on the navy's chief product, "battle efficiency", that the success we both ardently desire can be achieved.

Wishing you that success in unstinted measure, I am, my dear Mr. Daniels,

Your true friend,

P. Decimus Muss.

S. P. Q. R. Retired.

P. S. You may recall that my own unique idea of alternate military com-

mand was abandoned about the time of the second Punic war. I believe your ideas are equally novel and feel sure our minds meet on the common ground of dislike and distrust of that patrician Carlinus.

P. D. Muss.

A Prophetic Utterance

In the light of subsequent events, the following abstract from an article written by Arthur Balfour and published last May possesses almost prophetic vision:

"The external facts of the situation appear to be as follows: The greatest military power and the second greatest naval power in the world is adding both to her army and to her navy. She is increasing the strategic railways which lead to frontier states—not merely to frontier states which themselves possess powerful armies, but to small states which can have no desire but to remain neutral if their formidable neighbors should become belligerents. She is in like manner modifying her naval arrangements so as to make her naval strength instantly effective. It is conceivable that all this may be only in order to render herself impregnable against attack. Such an object would certainly be commendable, though the effort undergone to secure it might (to outside observers) seem in excess of any possible danger. If all nations could be made impregnable to the same extent, peace would doubtless be costly, but at least it would be secure. Unfortunately, no mere analysis of the German preparations for war will show for what purpose they are designed. A tremendous weapon has been forged; every year adds something to its efficiency and power; it is as formidable for the purposes of aggression as for purposes of defense. But to what end it was originally designed, and in what cause it will ultimately be used, can only be determined, if determined at all, by extraneous considerations.

"I here approach the most difficult and delicate part of my task. Let me preface it by saying that ordinary Englishmen do not believe, and certainly I do not believe, either that the great body of the German people wish to make an attack on their neighbors or that the German government intend it. A war in which the armed manhood of half Europe would take part can be no object of deliberate desire either for nations or for statesmen. The danger lies elsewhere. It lies in the coexistence of that marvelous instrument of warfare which embraces the German army and navy, with the assiduous, I had almost said the organized advocacy of a policy which it seems impossible to reconcile

with the peace of the world or the rights of nations. For those who accept this policy German development means German territorial expansion. All countries which hinder, though it be only in self-defense, the realization of this ideal, are regarded as hostile; and war, or the threat of war, is deemed the natural and fitting method by which the ideal itself is to be accomplished."

Taking Over Warships

The British navy has obtained some valuable reinforcements in the shape of certain warships destined for foreign countries which were just completed in Great Britain. The admiralty exercised its right of preemption, and as the country was actually in a state of war the vessels could not have been delivered to their respective owners. The first of these, now called the *Agin-court*, had already changed owners. She was first designed for the Brazilian navy, and was built by Messrs. Armstrong, Whitworth & Co., at Elswick. In this phase of her existence she was known as the *Rio de Janeiro*. Her displacement is 28,000 tons, and she is designed to steam 22½ knots per hour. In December last she was acquired by the Turkish government, as a reinforcement for their diminished navy, and was renamed *Osman I*. She was recently docked at Plymouth, and was almost ready for sea. She is a very fine ship and heavily armed, having no less than fourteen 12-inch guns, in addition to twenty 6-inch guns. The second battleship newly acquired is to be known as the *Erin*. She has been built at the Vickers yard, and is just completing, having been launched in September last. She was designed for Turkey, and has hitherto borne the name *Reshadie*. She has a displacement of 23,400 tons, and her speed will be 21 knots. She is practically a sister ship of the *Iron Duke* class in the British navy. In addition to these, two destroyers, to be named the *Faulkner* and the *Broke*, have also been acquired. They were intended for the Chilean navy, and are the heaviest destroyers in the world, and probably the fastest. They are of 1,850 tons displacement, and have a speed of 31 knots.

Mr. Franklin's Opinion

In an interview, P. A. S. Franklin, vice president and general manager of the International Mercantile Marine Co., said:

"The ship registry bill, in my opinion, goes a long way to help build up a mercantile marine by facil-

itating the transfer of ships from a foreign register to the American flag. Here is now the opportunity for American capital invested in shipping to place upon the national register the ships owned by it, and immediate relief should follow in increasing our tonnage to meet the lack of ships we suffered from at the outbreak of the war.

"As to the operation of the ships, the proclamation of the President, which he is authorized to make and which I understand he is likely to make at once, will place our ships in a better position to meet the competition of foreign-owned ships operated at less expense than our present laws permit us in carrying on the steamship business as a calling of its own.

"One of our ships may be transferred immediately under the new law.

"With regard to the war risks insurance bill, this is an emergency bill and its going immediately into effect on the President signing it will help the situation for this reason. There is not enough insurance available in the local market to cover the valuable cargo of a modern big ship. The government assistance in this direction will practically release much cargo that is offered and has been held back by the high rates that have been exacted.

"There is the question of building ships for the American register. I have stated and repeat it that for the American Line the International Mercantile Marine is willing to build steamships to be always available for the government's service as express mail carriers and for use as auxiliary cruisers when circumstances demand if the government will bear a share of the cost, in the same way as that in which the *Mauretania* and *Lusitania* were built with the pecuniary assistance of the British government."

The steamer *Pacific*, building for the Emery Steamship Co., Boston, was recently launched at the yard of the Fore River Shipbuilding Corporation, Quincy, Mass. The *Pacific* is a sister to the *Atlantic* which went into commission during August, and is 450 feet long over all. Both vessels will be operated in the coast to coast trade via the Panama canal.

The United States torpedo boat destroyer *Nicholson*, 315 feet long, 30 feet 6½ inch beam, with a draft of 9 feet 4½ inches, was launched from Cramp's yard, Philadelphia, on August 19. She is designed for a speed of 29 knots and carries a battery of four 4-inch guns.

Isherwood System of Construction

*In Which the Author Discusses Lloyd's
Rules Which Meet Every Consideration*

By Robert Curr

BY A careful study of Lloyd's rules it will be seen that they cover every part of a vessel, to the smallest clip and meet every consideration necessary in a well built ship. It effects considerable saving in time by adopting the rules when designing a vessel for the preliminary work is extensive before facts are arrived at and only the same results can be accomplished.

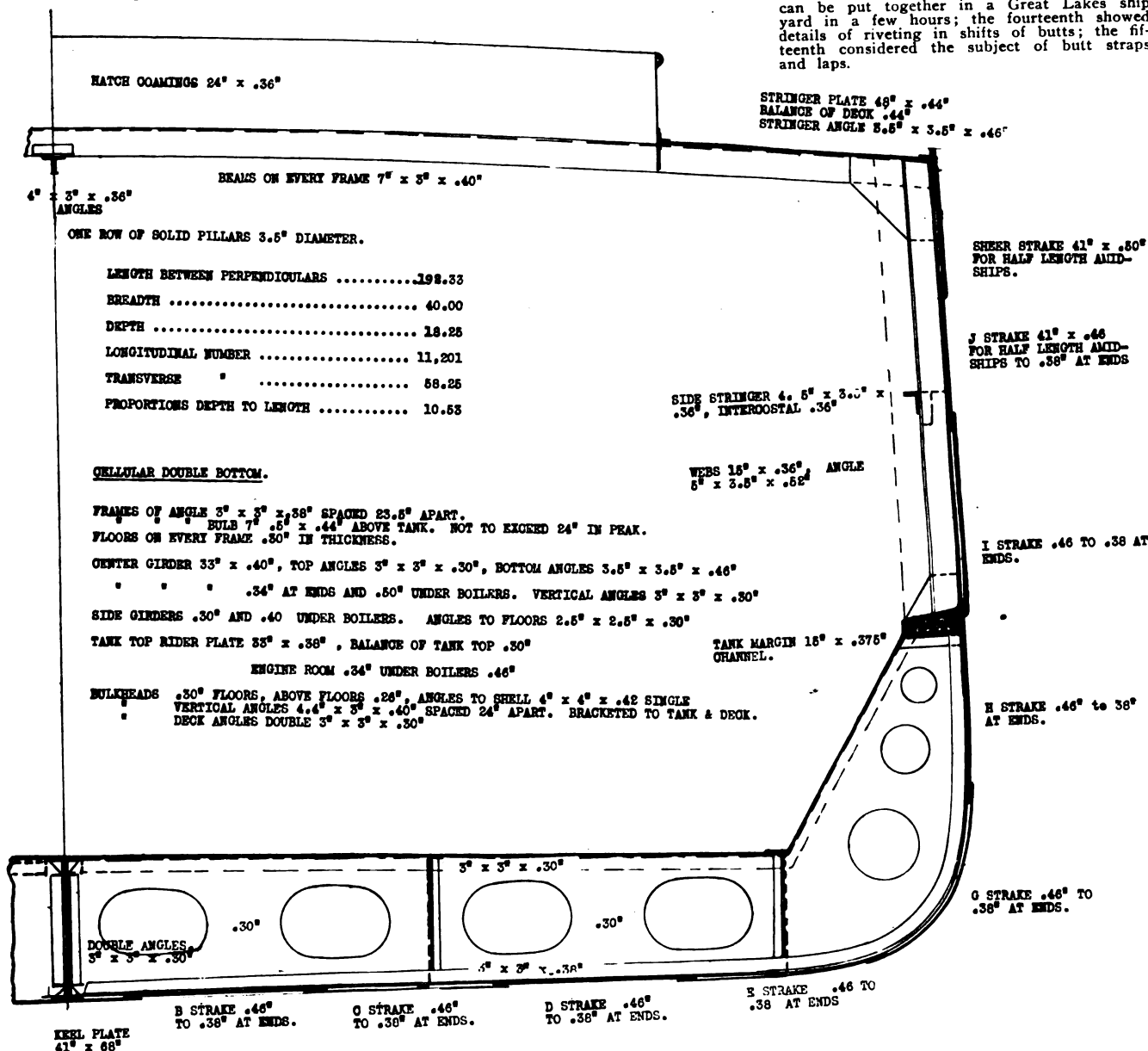
The section herewith is similar to Fig. 1 but of the transverse system and the scantlings as per Lloyd's rules. This vessel has a half girth of 36 feet 9 inches width of waterbottom from ship side, at line of tank top 4 feet and height of tank side 5 feet

above tank line. This arrangement of tank will have the margin 5 feet above tank top at the side, instead of at the bilge, and as the distance between the tank top at side and deck is over 7 feet, a side stringer must be fitted, as shown. If the tank had run down at the bilge instead of up the depth between the tank top and deck would be 15 feet 9 inches, and would require two side stringers or a web 15 inches deep with one stringer of the same depth for a vessel of this size.

In this vessel with a tank margin turned down there would be a space of 5 feet around the bilge making the girth from the tank margin 21 feet.

The frame spacing is 23.5 inches, making an area between the frames of 41.125 square feet. Considering the case of the web and side stringer would leave practically an area of

*This is the fifteenth of a series of articles on the Isherwood system of construction which began in the September, 1912, issue of THE MARINE REVIEW. The first article dealt with the general specifications of the steamer; the second with the sheer, half-breadth and body plans; the third explained the method of getting the sheer; the fourth dealt with the longitudinal and transverse framing; the fifth with offsets; the sixth with the shell plating; the seventh with the arrangement of plates and angles forming the spar deck; the ninth with the transverse; the tenth with bulk head construction; the eleventh with the connection of longitudinal frames to the bulkheads and transverse; the twelfth showed the interior framing between the tank top and spar deck; the thirteenth showed the amount of work that can be put together in a Great Lakes ship yard in a few hours; the fourteenth showed details of riveting in shifts of butts; the fifteenth considered the subject of butt straps and laps.



unsupported plating of 20 square feet.

In the bottom the rules call for an intercostal girder for tank not exceeding 36 feet, and again considering the slant of the margin plate there will be 40 feet of shell plating between the center girder and tank margin.

In Fig. 1 the longitudinal frames are spaced 32 inches apart and the transverses 76.375 inches, leaving only 17 feet square of unsupported plating. On the side between the tank side and deck there is the same spacing of longitudinal frames, but the transverses are double the spacing than in the bottom, but this is made up with the fenders.

The deck stringer plate has an unsupported area of 24 square feet, but with added strength of the longitudinals inway of the hatches it will be shown that it is very much in favor of the lengthwise arrangement.

The transverse framed section shows one strake more of outside plating than the other. The rules call for the outside plating not to exceed 54 inches on a vessel of these dimensions.

It would seem that the side plating unsupported in a vertical direction would be more apt to buckle than horizontally when the vessel was experiencing sagging strains. The narrow plates would contribute a little stiffening and assist the plating some. The narrow plate laps would also add to the strength of the plating over the broader plate which will be shown later on.

Width of Plating

The width of the plating on the longitudinally framed vessel is governed by the frame spacing. The laps of the plating require to be a suitable distance away from the longitudinal to insure good workmanship.

The thickness of the materials is given by the rules in decimals of an inch, while on the lakes the weight per square foot is the custom. It would seem that the decimal system is more correct for the adding or subtracting of a few pounds would not be so noticeable as a decimal. Again, one is more apt to assume a standard of 2½ pounds, as: twenty, 22.5, 30 pounds and so on.

The transverse framing section, as per rule, shows the stringer 48 x 44 inches thick; sheer strake, 41 x 50 inches thick, while on the longitudinal section, Fig. 1, the stringer plate is 72 x 55 inches thick, and the sheer strake, 48 x 55 inches thick.

The wide stringer has become a custom on the Great Lakes, and as the butts are clear of the hatches and the deck plating forming a passing strake, no fault has been found nor

harm apparently done so far. The sheer strake was made in width to suit the longitudinal frame spacing.

The keel plate by rule is 41 x .68 inches thick, while the other shows 36 x .674 inches thick.

The plating on the longitudinal section shows .429 and .367 instead of .46 and .375.

The transverse framing section is for salt water and again the lake vessel shows very little decay compared to a salt water vessel. Twenty-one and a half per cent is allowed over the estimated weights so that the lake vessel when completed will compare with the other, for the percentage is seldom found under as a rule.

Steamer Cristobal Remodeled

The steamer Cristobal of the Panama Steamship Line, which is an adjunct of the Panama railroad, has been transformed into a transport at the yard of the Robins Dry Dock & Repair Co., Erie Basin, N. Y. The Cristobal was formerly the Tremont of the Boston Steamship Co.'s fleet and was originally a freight carrier exclusively. She was later fitted with passenger quarters amidships with accommodations for about 100 passengers. When taken over by the Isthmian Canal Commission she was used principally for carrying cement to the canal zone, though her passenger quarters were always comfortably filled. Her interior has now been entirely remodeled to accommodate 2,200 passengers and the work was rushed in the brief interval of six days. She can accommodate 2,034 passengers in her upper and lower 'tween decks, 726 berths being fitted in the upper 'tween deck, 1,272 in the lower 'tween deck and 36 in a hospital located in upper 'tween deck forward. The berths are of the iron Standee type which can be raised and folded when not in use. Ventilation is by means of air ducts laid along the side of the ship and fed by motor-driven fan located on the upper deck forward. There also had to be fitted in each of the four compartments, wash rooms, showers and toilet rooms. Each deck was equipped with a new pantry while an entirely new steam galley had to be installed with cooking ranges, steam kettles and bake ovens. Provision also had to be made for electric lighting in the improvised passenger quarters and the old steerage dining room completely refitted. That the work could have been done in six days is extremely gratifying and shows after all that American yards can be relied upon to remodel vessels with great

rapidity should it become necessary to turn them into transports.

Torpedo Boat Destroyer Lance

Probably no warship ever launched went into action more quickly than the British torpedo boat destroyer Lance. She was delivered from Thornycroft's yard on Aug. 1 and on Aug. 5 she sank the Konigin Luise, which was laying mines in the North Sea, being the first naval casualty. The British cruiser Amphion was shortly thereafter blown up by one of the mines that the Konigin Luise had laid, killing 130 men. The Amphion was built in 1911 by Hawthorne, Leslie & Co., and was of 3,440 tons displacement. Her commander, Capt. C. H. Fox, was saved and has since been given command of the destroyer Faulkner. Capt. Fox has had a rather strenuous career of it. He was a midshipman on the British cruiser Calliope, which escaped from Apia, Samoa in 1889 from that terrible storm which devastated the island and settled the impending quarrel between the United States and Germany by wrecking all their warships. The American and German ships remained in the harbor but the Calliope went out to meet the storm. Her passage through the narrow channel in the coral reef to the open sea was a marvel of seamanship, but she fought the great hurricane successfully, returning to Apia the next day to find that the rest of the fleet had been torn from their moorings and blown high on the rocks where at least one of them may be seen to this day.

Torpedo Boat Destroyer Ericsson

The torpedo boat destroyer Ericsson was launched from the works of the New York Shipbuilding Co., Camden, N. J., on Saturday, Aug. 22, last. She is a torpedo boat destroyer of the larger class, 300 feet in length, 30 feet in breadth and of 1,100 tons displacement. A speed of 29 knots is anticipated, a twin-screw Parsons' turbine drive being fitted. Steam is supplied by four Thornycroft type boilers. The vessel is armed with rapid-fire guns and deck torpedo tubes, and is expected to be ready for service by the end of the year.

The George Stratford Oakum Co., Jersey City, N. J., announces that they use rope made of Russian and Italian hemp, tarred or untarred, but that they cannot use any jute, manila, sisal, isal, or other hard fibre. They do not use bale rope or any rope less than one inch diameter.

Our Merchant Marine

*A Plan Outlined for its Upbuilding and
its Great Benefit to the United States*

By Capt. Alexander McDougall

THE following are some ideas that may help others to look at the conditions of the shipping interests of this country in connection with the world at large, and I hope may be the means of leading more able men to force the American ship upon the seas in great numbers. When a ship is made it is the nearest thing to life that man can create, and it becomes an agent for the country to which it belongs; and, for a large ship, the average ownership is more than ten persons to one ship, so that if this ship is made to trade from its own country to other countries, there is more than ten agents created when the ship is built. The following table of the world's shipping, by Statistician Mulhall, will give some idea of the numerous agents some of the countries must have to hunt up trade for so many ships, the probable average size of the ships, included in this table being less than 3,000 tons each:

	Tons carrying power.	Ratio.
British	27,720,000	56.6
Scandinavian	4,240,000	8.8
German	3,870,000	8.0
French	2,410,000	4.9
Spanish	2,020,000	4.2
United States	1,680,000	3.4
Italian	1,410,000	2.8
Russian	1,280,000	2.4
Various	4,280,000	8.9
Total	48,840,000	100.0

American's Small Tonnage

It will be observed by this table that we have only about $3\frac{1}{2}$ per cent of the world's tonnage belonging to this great country and the most of that is employed in our coasting trade, which no foreign vessel can do, and that part which is employed in foreign trade is either running at a loss or under some peculiar advantages, such as the few sailing ships that carry cargo from the east coast to the west coast of the United States (protected trade), and then go from there foreign with grain, lumber or products of our west coast, so as to get back again to the east coast, generally in an indirect way. And it is in the protected part of the voyage usually the only profit is made.

Lately, on our Pacific coast, my attention was called to the lumber trade that is carried on between Puget sound ports and South Africa and

other foreign countries, where there were two American steamers of about 4,000 tons capacity each that would liked to have carried some of this foreign product, but could not take the low rates offered, when in came two English tramp steamers of about 6,000 tons capacity each and took away cargoes of this lumber. I got the wages paid on these different steamers, and when it is known that the United States steamers, although they may be smaller, cost more than the large foreign steamers, and when the following comparative list of wages paid on each is taken into consideration, the matter is easily explained. The trade belongs to the English tramp steamer, the American ship not being in it as far as foreign trade is concerned.

Comparative Scale of Wages

The following is the comparative scales of wages paid:

American tramp steamer of about 4,000 tons:
Captain, per month..... \$200.00
Mate, per month..... 90.00
Second mate, per month..... 60.00
Eight sailors, \$35 per month..... 280.00
Chief engineer, per month..... 150.00
First assistant, per month..... 90.00
Second assistant, per month..... 80.00
Third assistant, per month..... 70.00
Three oilers, \$50 per month..... 150.00
Six firemen, \$50 per month..... 300.00
Six coal passers, \$40 per month..... 240.00
And others, in all 34 men, and, if on a very long voyage, according to United States government and union sailors' requirements, third mate and one or two more men must be furnished. Provisions per day per man, about 75 cents.

British tramp steamer of about 6,000 tons:
Captain, per month..... \$ 90.00
Mate, per month..... 45.00
Second mate, per month..... 35.00
Six sailors, \$17.50 per month..... 105.00
Chief engineer, per month..... 75.00
Second engineer, per month..... 57.50
Third engineer, per month..... 38.00
Six firemen, \$17.50 per month..... 105.00
And others, in all 26 men. Provisions per day per man cost about 34 cents.
No oilers or coal passers carried.

On the Atlantic coast the difference is not so great, because there is more shipping and more foreigners in port to draw from. Now let us look at the men who build the ships and the wages paid in European shipyards and in the yards of this country, and you will see why the difference of first cost. The salaries paid to the office and designing force is about double the salaries paid in European shipyards.

The following is a comparative list

of wages paid in British and American shipyards:

	Rate of wages paid per week,	
	British.	American.
Pattern makers.....	\$9.00	\$18.00
Machinists	8.50	15.00
Riveters	7.50	12.00
Caulkers and chippers....	7.80	15.00
Beam and angle smith....	8.40	15.00
Holders, on	4.20	9.00
Fitters up	7.80	15.00
Ship carpenters	9.60	18.00
Joiners	9.00	16.50
Painters	9.60	18.00
Ship shed machine men...	7.20	15.00
Furnace men	6.00	10.80
Riggers	7.20	11.00
Drillers	6.40	11.00
Sheet iron workers.....	8.50	15.00
Copper smiths	8.60	18.00
Molders, iron	9.00	14.50
Molders, brass	9.00	15.00
Laborers	4.20	8.50

To build a good merchant ship for all the world trade in the United States at the present time will cost about one-half more than in Great Britain. Thus, a steamship that would cost \$300,000 in the United States would cost but \$200,000 in Great Britain, so that for the life of that ship there would be \$15,000 yearly in favor of the British ship, as follows:

Insurance, $6\frac{1}{2}$ per cent; interest, $4\frac{1}{2}$ per cent; depreciation, 4 per cent, on the \$100,000 difference in first cost. Then would come the difference in operating expenses, crew, shore management, insurance, foreign agency and exchange, all of which we are not well skilled in its manipulation, which would amount to nearly as much as the difference in first cost; all of which does at first look very discouraging to us, but a plan suggested later on may help us to overcome part or all this great difference.

Too Many Frills

Different shipping bills have been introduced in Congress in the last ten years, but some or most of them have been loaded with frills and requirements of classification, societies, speed, etc., all of which would afterward usually take care of itself, if the proper assistance was at first given by our government to help us introduce our own skill at sea and to the world, and I think it can be done, and at the same time maintain higher wages than paid in any other country, both on manufacturing and shipping. More than \$200,000,000 is paid to foreigners yearly to do our

shipping. If we could only do one-half of this, what a commencement it would be to the greatness which this country will some day reach. I think we have more iron ore and coal than all Europe, and of a good quality, opened up and developed, and right in amongst where the greatest part of our population lives, and can cheaply be brought to our coast. And doubtless we have the skill to manufacture it into the various requirements for home and foreign trade, or to build ships from, and if we are in this position we must do something to give employment to that multitude of intelligent men who are idle in this country. But first let us see what makes so many of them idle.

Great Britain's Progress

About 50 years ago we began building railroads. About the same time Great Britain began to build ships of iron. And, particularly since our last war, we have built railroads so fast it was the cause of the greatest outlay of capital ever known, most of which came from other countries, until, if you look at a railroad map of this country you can hardly see the states for the railroads, and the people got rich and prosperous from the trimmings incident to building and operating these railroads, which roads opened up new fields and mines, and from such rich lands great crops were raised that required machinery to handle quickly and cheaply; and with the mixed intelligent population from Europe and Yankee ingenuity farming implements of all descriptions were invented, larger crops and cheaper transportation to seaboard were obtained, and a high state of prosperity was with us till about four years ago. We were a live commercial people, having about 250,000 commercial travelers stirring up trade with ourselves, until it only required a few days to introduce a new thing all over the United States.

But this live trade was only with ourselves, and, for the want of our own ships, we had built a wall around ourselves and we had overdone the railroad building, so that at present there are more than a million men idle, many of whom were employed in building railroads, and also in the operation of roads which have had to cut down their large forces.

The difference between the cost of building, owning, and operating an ocean-going ship of today of the United States and that of some of the European countries is about equal to one and one-half cents per ton per 100 miles carried at sea; so that

if our government could give a bounty of two cents per ton per 100 miles an American ship would carry a ton of freight from the United States to any foreign country, or that would carry a ton of freight from and foreign country to the United States, to be paid as follows: From the Treasury of the United States by reports made to or obtained from customs officers at ports in the United States, and by reports to or from United States consuls in foreign ports, taken from the ship's manifest, and by Washington time, exact hour and date, which would be forwarded to the treasury department to be filled in the order of time the voyage might be finished, so that in case there has not enough been appropriated, the first in and on record will earn the premium, and like most all other classes of business there is a fair chance it will be overdone at times.

The sum to be paid not to exceed \$50,000,000 in ten years, to be paid about as follows:

First year	\$ 3,000,000
Second year	4,000,000
Third year	5,000,000
Fourth year	6,000,000
Fifth year	6,000,000
Sixth year	6,000,000
Seventh year	5,000,000
Eighth year	5,000,000
Ninth year	5,000,000
Tenth year	5,000,000
Total	\$50,000,000

Manner of Paying Subsidies

It is necessary to begin on smaller amounts, for there are not yet ships to earn so much, and, after the sixth year, we should have had such experience as to enable us to sail on with less direct assistance. And with the live enterprise of our people, when a paying investment presents itself, I think before the end of ten years we would have ships enough to get this bounty in the first half of the year, this bounty to be paid to such ships only as are owned in the United States, and not earning government bounty from mail subsidy, and vessels made in this country from American products, offered by citizens of the United States and the crew to be composed of one-half, at least, American citizens when leaving home ports. For the first five years of the payment of this premium, then, after that, at least two-thirds of the crew must be citizens of the United States when the ship is leaving the United States for a foreign port, and no bounty to be paid on more than 10,000 miles in the same voyage going or coming. All other requirements, such as government inspection of ship officers, etc., and the chassification for instance, etc., not to be

any of the requirements of this bill, it all to be taken care of as usual. If such a bounty is not earned or paid it would remain in the treasury, and if earned as above and paid out for such services, let us look at some of the advantages that would be derived from it.

Widespread Benefits to Accrue

Hundreds of millions of dollars' worth of ships, shops, factories, etc., would grow up as from nothing. It would eventually cause to be established with us marine insurance companies, banks to do direct trade with ports of the world, now reached indirectly, and would bring us in closer touch with all of the America south of us, and with the Orient, which must develop fast in the near future, and whose trade others will acquire if we are not after it soon. The trade from our Pacific coast is much greater in tonnage and freight money than many realize and its future more promising in most all kinds of products. Many of these ships that would earn this money would go in trade such as timber and lumber from the east and west coast of Africa, when a voyage between two foreign countries might be of advantage or with Pacific coast products to Europe, when some other trade would offer better than coming back in ballast or small cargo, so that it is fair to expect a good part of the time our subsidized ships would be in a trade in which they would not earn this bounty. There is an enormous trade in the southeastern part of this country that is moving slowly that would receive a great stimulus by having our own ship and numerous agents in Europe trying to sell their lumber and timber, and in the West Indies, Central and South America trying to sell the coal from the section referred to; also lots of other products from this section.

The Mississippi Valley would necessarily get a great benefit from our own ship and its many friends, who would all be working in dead earnest to get each their share of the premium. Steamship lines from New Orleans and Galveston would naturally come, and in more regular trade than now, for the owners, agents, and managers would be of the people with us. Our northeast coast would probably derive the greatest advantage generally. The lake region would receive a great indirect benefit because of the enormous iron and coal deposits there, which would be stimulated by the building of ships and being in direct touch with the northeast coast. In fact, there is not much, if any,

part of the United States that would not get a direct or indirect benefit from our owning many ships at sea. In order to earn the premium of the fourth year it would require 300 or 400 ships, and as nearly all of these would have to be made, what a stir it would create in this country to make them. The capacity of the shipyards throughout this country would be insufficient to meet the demand and would even be unable to make ships for our coasting or protected trade, which would increase in sympathy with the growth of our foreign shipping, and consequently, new steel plants, new shipyards, machine shops, boiler shops and the various mines and factories which would start up with such an impetus would help to keep the people in the towns and cities, and thus give to the farmers more of an assurance that the idle multitude would not go into the country, thereby causing an overproduction of farming products, for it is very evident that some will have to do this if relief is not at hand quickly.

What Will the Outcome Be?

The question may be asked: What will become of this ocean shipping of ours at the end of ten years? If it is then known to be a good thing, a bounty can be continued a few years longer. But there is a fair chance, our ships so assisted, we would learn the art of much cheaper construction and operation, and might get along without further direct assistance from our government, as in the case of the trade done by United States ships on the great lakes, which at present is much greater than all the ocean trade done by the United States ships. They will have had practically a protected trade and cheap raw material to build from experience, competition with each other, and forcible, intelligent management, with improved appliances to quickly and cheaply handle cargo. They will have learned to do the cheapest transportation in the world, for, notwithstanding the fact that high wages are paid, lake ships are making a fair profit at rates only half the cost of doing the same work, with the same ships, on the same draft of water, of ten years ago. This comes from forcible, intelligent knowledge of how to do the work, and much of the same results, I think, would come if we had ten years of such right of way at sea.

The advantages of making, owning and operating our own ships, and then, through a subsidy such as this, hunting for trade both ways, cannot be seen

at a glance. There are so many good features to it in so many ways, directly and indirectly. It should have careful, honest consideration, and not the sentiment of foreign shipowners and their agents. I think the art of shipbuilding and the cheapest system of operating them is now at hand, and that we may yet be among the foremost in this matter, even if we pay more to our intelligent workers; so let us assist the ship somewhat along these lines and make 300 or 400 modern built ships trading to and from this country and we shall then have thousands of agents to increase our foreign trade with the world at large.

Plans of Destroyer

The Bureau of Construction and Repair, United States Navy Department, is working on plans for the five new torpedo boat destroyers and the submarines recently authorized by Congress. Little change is expected in the design of the destroyers from

those built in the last few years. Although navy officials are on the alert for betterments, this design is regarded as the most improved type. However, it is possible that the displacement of the submarines will be increased to permit increased speed and additional armament. The general tendency is to bring the submarine to the size of the destroyer.

It is announced that the Dollar Steamship Line of San Francisco, Cal., will award contract in the near future for the construction of a new steamer similar to the Robert Dollar, capable of carrying more than 5,000,000 feet of lumber. The new vessel will be known as the Harold Dollar.

The Union Iron Works, San Francisco, Cal., will contract shortly for the huge dry dock which it is to build on the government guarantee of \$50,000 worth of business every year for six years. The total cost of this construction is estimated at more than \$2,000,000.

SUMMARY OF NAVAL CONSTRUCTION.

Name of vessel.	Contractor.	Per cent of completion.			
		Sept. 1, 1914.	Aug. 1, 1914.	Sept. 1, 1914.	Aug. 1, 1914.
		Total.	Per cent on ship.	Total.	Per cent on ship.
BATTLESHIPS.					
Nevada	Fore River Ship Building Co.	73.3	66.0	72.4	64.4
Oklahoma	New York Ship Building Co.	74.1	71.7	72.6	69.8
Pennsylvania	Newport News Ship Building Co.	47.2	37.3	42.0	33.4
Arizona	New York Navy Yard.	29.2	22.4	24.4	19.1
DESTROYERS.					
Downes	New York Ship Building Co.	95.3	95.3	95.3	95.3
O'Brien	Wm. Cramp & Sons.	83.0	80.9	79.0	76.8
Nicholson	Wm. Cramp & Sons.	80.2	77.8	73.3	70.5
Winslow	Wm. Cramp & Sons.	73.5	70.3	71.5	68.4
Cushing	Fore River Ship Building Co.	62.2	58.0	56.1	51.1
Erie	New York Ship Building Co.	82.0	81.6	76.9	76.5
Tucker	Fore River Ship Building Co.	14.6	7.7	12.6	6.1
Conyngham	Wm. Cramp & Sons.	19.8	14.6	11.1	4.6
Porter	Wm. Cramp & Sons.	12.3	5.5	9.0	2.5
Wadsworth	Bath Iron Works.	57.0	53.7	48.4	44.3
Jacob Jones	New York Ship Building Co.	23.8	20.5	14.9	6.8
Wainwright	New York Ship Building Co.	21.4	18.1	14.4	6.3
DESTROYER TENDERS.					
Melville	New York Ship Building Co.	62.8	60.8	59.7	57.3
SUBMARINES.					
G-4 (2)	American Laurenti Co. (Philadelphia).	96.4	95.5	96.4	95.5
G-2 (1)	Lake Tow Boat Co. (Bridgeport).	89.7	89.7	89.7	89.7
G-3 (1)	Lake Tow Boat Co. (Bridgeport).	83.0	82.6	82.3	81.9
K-3	Electric Boat Co. (Seattle).	99.0	99.0	98.1	98.1
K-4	Electric Boat Co. (Seattle).	99.0	99.0	98.8	98.8
K-5	Electric Boat Co. (Quincy).	99.0	99.0	98.8	98.8
K-6	Electric Boat Co. (Quincy).	99.5	99.5	98.8	98.8
K-7	Electric Boat Co. (San Francisco).	94.7	94.7	94.3	94.3
K-8	Electric Boat Co. (San Francisco).	94.8	94.8	94.3	94.3
L-1	Electric Boat Co. (Quincy).	55.5	49.5	49.3	43.6
L-2	Electric Boat Co. (Quincy).	55.7	49.5	48.2	42.0
L-3	Electric Boat Co. (Quincy).	53.8	46.7	47.3	40.9
L-4	Electric Boat Co. (Quincy).	53.1	45.9	46.6	40.1
L-5	Lake Tow Boat Co. (Bridgeport).	34.0	28.6	28.9	24.8
L-6	Lake T. B. Co. (Long Beach, Cal.).	33.7	29.0	28.1	24.0
L-7	Lake T. B. Co. (Long Beach, Cal.).	33.0	28.0	27.6	23.9
M-1	Electric Boat Co. (Quincy).	38.7	32.9	33.1	27.4
L-8	Portsmouth, N. H., Navy Yard.	14.9	8.8	12.3	6.9
L-9	Electric Boat Co. (Quincy).	14.6	8.5	12.3	6.9
L-10	Electric Boat Co. (Quincy).	14.6	8.5	12.3	6.9
L-11	Electric Boat Co. (Quincy).	14.6	8.5	12.3	6.9
SUBMARINE TENDERS.					
Fulton	New London S. & E. B. Co. (Quincy)	90.6	90.6	81.4	80.6
Bushnell	Seattle Construction & Dry Dock Co.	52.9	44.8	47.3	39.4
FUEL SHIPS.					
Kanawha	Mare Island Navy Yard.	75.0	74.4	71.2	70.6
Maumee	Mare Island Navy Yard.	41.9	40.2	35.4	30.9
MISCELLANEOUS.					
Supply Ship No. 1.	Boston Navy Yard.	...	...	...	...
Transport No. 1.	Philadelphia Navy Yard.	...	...	...	...
PANAMA CANAL COLLIERS.					
Ulysses	Maryland Steel Co.	42.2	35.8	34.6	25.5
Achilles	Maryland Steel Co.	37.6	28.0	30.8	20.0

(1) Contracts forfeited, vessels being completed, New York yard.

(2) Conditionally delivered at Philadelphia yard Jan. 22, 1914.

*Delivered Aug. 20, 1914.

Collision in Fog

The Princess Victoria Sinks the Admiral Sampson and Both Claim That the Other Vessel Was Going at Full Speed

FOG of unprecedented density and length resulted on the early morning of Aug. 26 in one of the most disastrous marine disasters in the recent history of Puget Sound. In a collision the Canadian Pacific express passenger liner Princess Victoria, bound from Vancouver, B. C., to Seattle sank the American passenger and freight steamer Admiral Sampson, bound from Seattle to points in Southwestern Alaska. The collision took place 20 miles from Seattle.

Eleven lives were lost on the Admiral Sampson, three passengers and eight members of the crew. The Admiral Sampson is a total loss with her cargo as she sank in water nearly 200 feet in depth and salvage is impossible.

Libel suits, which will probably result in hard fought litigation in the courts, has already followed. The Pacific-Alaska Navigation Co., owners of the lost steamer, have libeled the Princess for \$670,000 of which \$500,000 represents the value of the Admiral Sampson, \$150,000 the value of her capacity cargo and the balance for baggage and miscellaneous expenses. The Canadian Pacific on the other hand has brought suit for \$20,000 which is claimed will be the cost of repairing the Victoria. The latter vessel is still tied up in Seattle under the libel. Owing to the heavy amount asked by the owners of the Sampson, the bonding companies have hesitated about releasing the Victoria which might return to Canadian waters and not return in order to avoid the expensive litigation. Such a course was adopted on Puget

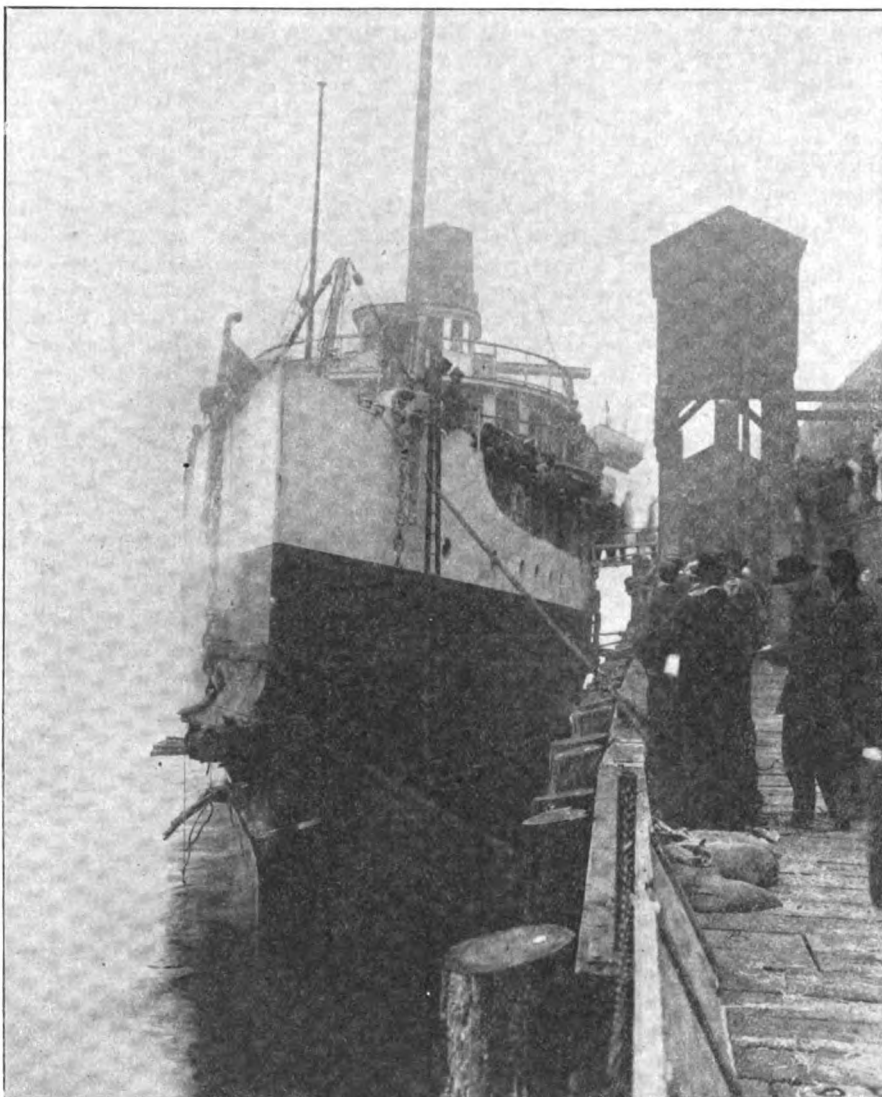
Sound a number of years ago when the steamer Premier sunk the steamer Umatilla. Before the owners of the latter could seize the Premier, the latter was

awakened and rescued. In view of the dense fog, the fact that it was in the early morning, about 5:45 and the fact that the Sampson sank almost instantly in extremely deep water, the fact that so few lives were lost is pointed to as excellent evidence that splendid seamanship prevailed. The survivors were picked up by boats from both steamers. Capt. Z. S. Moore, one of the oldest Alaska navigators and Chief Engineer A. J. Noon, were among the victims. Capt. Moore could have been saved but he elected to go down with his vessel.

After cruising about the scene for several hours, the Victoria came to Seattle with the survivors. As shown in the accompanying photograph she is seriously damaged. A great gash was cut in her bow and it will be necessary to rebuild her entire stem. In withdrawing from the Sampson, the Victoria carried away a portion of the Sampson's hatch coming and a part of the hatch cover as the photograph shows.

The Admiral Sampson was a fine,

fast steamer, twin screws with oil burning apparatus and thoroughly modern. She was built at the Cramp yards in 1898 being of 1,337 tons net. She formerly plied out of New York in the West India fruit trade for the American Mail Steamship Co. but was brought to this coast about four years ago. After being overhauled, equipped with oil burning apparatus and remodeled at a cost of \$150,000, she was placed on the route between Seattle and San Francisco and later transferred to the Alaska route by the Pacific-Alaska Navi-



STEAMER PRINCESS VICTORIA AFTER COLLISION WITH THE STEAMER ADMIRAL SAMPSON

spirited away to British Columbia waters where she has since remained in service having been renamed Charmer. She has never come into American waters since in order to avoid service.

Both sides claim that the other vessel was proceeding at full speed in the fog. The Victoria struck the Sampson on the port side abreast the after hatch and probably cut half way through the steel hull of the Sampson. The latter vessel sank in less than ten minutes, all of her 75 passengers but three being

gation Co. This same company recently purchased the sister vessels Admiral Dewey and Admiral Schley which have just arrived from New

York and are to be placed on the Seattle-San Francisco route this month. The Princess Victoria is a fast passenger steamer operating for the Canadian

Pacific on the triangular route between Seattle, Vancouver and Victoria, B. C., and has been a favorite with the trade.

After the World's Markets

Showing With What Wonderful System Great Britain is

Going After Germany's Export Trade—A Lesson To Us

VERY manufacturer, banker, merchant and all boards of trade should read the following article, reprinted from the *London Times*, because it reveals the promptitude with which Great Britain is going after new markets, setting an example which this country in strict justice to itself should not be slow in following.

Both Mr. Harcourt, Secretary of State for the Colonies, and Sir Edward Grey are taking part in the organized effort which is being made to secure for British manufacturers the trade with our colonies and with neutrals which was before the war largely in the hands of Germany and Austria-Hungary.

The following communication was issued from Downing street:

Bearing in mind the sudden cessation of the oversea trade with Germany and Austria the Secretary of State for the Colonies, with a view to alleviating to some extent the loss of business and employment both in the United Kingdom and the colonies, telegraphed on the 15th inst. to some of the more important colonies not possessing responsible government to remind them that it is of the utmost importance to have full information up to date respecting the principal imports into each colony from Germany and Austria and as to the products of each colony hitherto exported to those countries. The Secretary of State has further desired that he should have by the earliest opportunity particulars as to the leading lines of articles of trade with Germany and Austria, illustrated by samples in the same way as was arranged in 1895.

The Secretary of State has it in mind that action on the above lines will not only be an immediate benefit as regards employment in the United Kingdom, but should also lead to the permanent advantage of British trade in general.

It is understood that the trade commissioners in the various self-governing dominions are already kept closely in touch with the requirements of the trade in those dominions, and collections of samples of different lines of

goods in which British manufacturers might compete have recently been sent, or are on their way from certain parts of those dominions.

As regards neutral foreign countries the Secretary of State for Foreign Affairs has undertaken to send a similar request to his Majesty's consuls in all places where such an inquiry is likely to have a useful result.

The present intention of the Secretary of State for the Colonies is that, as soon as the samples from different parts of the empire and from neutral countries are collected the traders and manufacturers of the United Kingdom shall have an opportunity of inspecting them in a central exhibition, possibly at the Imperial Institute. At any rate, no time will be lost in making suitable arrangements to carry out this intention.

Board of Trade Campaign

The Board of Trade are moving on the same lines and have devised what promises to be a fruitful campaign for assisting British manufacturers and traders to take advantage of the war by establishing themselves, in neutral as well as colonial markets, in those branches of business which have hitherto been largely in the hands of their German, Austrian and Hungarian rivals.

In pursuance of this scheme the commercial intelligence branch of the Board of trade (73 Basinghall street, E. C.) are issuing to manufacturers and merchants, trade associations and chambers of commerce, monographs giving information with regard to possible foreign and colonial developments in certain important trades carried on by them or in their respective districts. The trades dealt with in the first series of monographs are cutlery, iron and steel wire, hollow-ware (enamelled or tinned), woolen and worsted piece goods and cotton hosiery (stockings and socks).

Markets Open to Attack From Britain
(From a Correspondent)

"He that rules the sea rules the commerce of the world, and to him

that rules the commerce of the world all the treasures of the world and, indeed, the world itself."—Sir Walter Raleigh.

It may be difficult at first to realize the fact—though fact it is—that, in spite of the country being at war with two great powers, British manufacturers and merchants may not only look with confidence for an early revival of the larger part of their overseas commerce, but may also confidently undertake the extension of their operations and the conquest, or reconquest, of foreign and colonial markets lost to them in time of peace.

The world's industrial and commercial machine is so delicately balanced that the sudden upheaval of the last two weeks has, naturally enough, for the moment thrown it out of gear, although not nearly so badly out of gear as 99 business men out of every 100 would have anticipated could they have foreseen the events that have happened. Already the machine begins to right itself. Confidence is being rapidly restored. The commercial community has risen splendidly to the occasion, and trade only waits the accustomed facilities for financing commerce to resume its normal progress to an extent that seems almost incredible.

The finance difficulty is the outstanding obstacle, both in regard to import and export trade. Lancashire, for instance, has to solve the problem of financing the importation of the cotton crop before she can obtain possession of the raw material on the manufacture of which approximately a third of our exports of manufactured goods depends. In Manchester the opinion is freely expressed that that particular problem will be solved within the week. In other quarters optimism prevails with regard to imports of raw materials and foodstuffs.

How little our import trade depends upon the two countries with which we are at war is shown in the following figures:—

British Imports in 1913

From Germany and Austria, £88,000,000.

From the rest of the world, £681,000,000.

Incidentally, it should not be forgotten how large a part our exports of coal, amounting to 76,000,000 tons in 1913, play in providing return freight for our enormous preponderance of imports over exports.

Turning to the export side, we find that while our exports to Germany and Austria amounted in 1913 to £45,000,000, the rest of the world took goods to the value of £480,000,000.

While, therefore, we definitely lose markets for goods to the value of £45,000,000, there is a market in the United Kingdom for goods at present supplied from Germany and Austria to the value of £88,000,000. Not all this market can be supplied from domestic sources; there are, of course, many commodities included for which we must look for sources of supply outside these islands, but there remains a considerable trade that is now awaiting the enterprise of the British manufacturer if he will seize it before other foreign competitors endeavor to take Germany's place, as will appear from the following table:—

Some British Imports of German Manufactures in 1913

Apparel	£1,200,000
Motor cars and parts.....	1,100,000
China and earthenware.....	750,000
Cotton manufactures.....	7,000,000
Dye stuffs.....	1,700,000
Fancy goods and embroidery	1,200,000
Glass	1,200,000
Woolen and worsted manufactures	2,000,000
Hardware and hollowware..	1,000,000
Leather manufactures, including gloves, but not boots and shoes.....	1,200,000
Toys and games.....	1,200,000
Electrical machinery.....	700,000
Machinery other than electrical	1,600,000

So much for these islands. There remains the vast world commerce which Germany, and, to some extent, Austria have painfully and laboriously built up in recent years. With their industries stopped, their shipping held up, and their credit impaired, the enemy can by no conceivable means continue to hold any but an infinitesimal share of the export trade to foreign and colonial markets during the continuation of the war. How much they will be able to regain after the war is over no one can predict. To capture as large a portion as possible of this world trade is the work of the immediate present. Other alert rivals are in the field, and in commerce, as in war, it is in the highest degree

dangerous to adopt dilatory tactics. If British trade takes no prompt action it is certain that other countries will. The prize is too rich to be long left unappropriated.

A New Situation

Not many years ago at such a crisis British manufacturers would have found themselves without any guidance whatever. Just as the Boer war found us unprepared in the military sense, so, had the present trouble arisen then, we should have found ourselves unprepared with any definite plans or organization in the commercial world. Today we are infinitely better equipped. Although still in many ways less efficient than could be wished, the Intelligence Department of the Board of Trade is, to a much greater extent than the general public imagine, ready for the present crisis, and it has with commendable promptitude taken steps for placing British manufacturers and merchants in possession of the information that they urgently need if the present opportunity is to be seized.

For some years the Board of Trade's commercial intelligence department in Basinghall street has made a practice not only of publishing official commercial information in the Board of Trade *Journal* and elsewhere, but also of sending direct to interested British firms whose names were filed other information, the publication of which in papers where it was available to our foreign competitors was not desirable. Much useful work has also been done quietly through the post in answering bona fide inquiries of a commercial nature, the services of the consular officers and trade commissioners being made of direct value to British trade, and the practice of indiscriminate correspondence between the consular officers and private traders, who might or might not be bona fide British firms, discouraged. An immense amount of information of a practical nature has in this way been acquired and arranged by the department, and it is now to be placed at the disposal of British trade in a most useful form.

Taking the principal articles of commerce in turn, the department is issuing to manufacturers and merchants whose names are on their list particulars of conditions concerning them in markets now held by German and Austrian trade. The first of these documents, dealing with enameled hollowware, etc., was issued on Monday of this week, and it is intended to issue, if possible, three similar pamphlets every day.

Opening with the statement that

exports from Germany of domestic and kitchen utensils and kitchen implements of sheet iron, etc., enameled, were valued at £1,776,000, while exports of sheet iron wares from Austria were value at £124,600, it is pointed out that the United Kingdom in 1913 only exported similar goods to the value of £531,000, tin plate hollow ware accounting for £335,000. Clearly, then, there are distinct possibilities for the extension of British exports, and a table is given setting out the value of present exports of such British goods to each of the principal markets now held by Germany and Austria.

Openings for Enterprise

In South Africa imports of enameled ware from Germany were valued at £43,972, compared with only £19,555 from the United Kingdom. It is pointed out that two years ago a British firm entered the market offering British-made enamel ware at the same price as German with considerable success, but slow delivery of orders resulted in the firm losing its hold.

In enameled buckets the simple fact that the absence of a foot to the bucket allows much closer nesting than in the case of the German line is held to be the reason for Britain's success.

From Australia the Board of Trade has recently received a collection of samples made by his Majesty's Trade Commissioner, and these are being classified, and full information will shortly be circulated to manufacturers. The same method has been followed in New Zealand.

In British India the opportunity to secure the trade of Austria and Germany in enameled iron ware seems particularly favorable. Use by the natives has recently shown a tendency to increase considerably.

In Egypt, enamel ware is pressing out trade in earthenware owing to cost of transport and the liability of breakage. The rapidly-growing trade is largely German and Austrian.

Even in Syria the trade is reported as rapidly growing. French and Belgian makers here share with Germans and Austrians in supplying the market, the objection to the British goods being their heaviness and costliness.

In China the trade is almost exclusively in German and Austrian hands. Colombia gets her supplies largely from Germany. China again is a fruitful field—for Germany; and the German makers hold the cheaper lines in plates and bowls in Belgian Congo.

It has been impossible in the space at disposal to do more than glance at

the salient features of this document, but perhaps enough has been said to indicate the value of its contents to manufacturers. Supplementing this information and similar matter concerning other articles, the department has arranged a postal and cable service of urgent commercial news from the consular officers all over the world, and this information will also be placed at the disposal of British trade with the least possible delay.

Screw Propellers

In a recent address before the graduate section of the North East Coast Institution of Engineering and Shipbuilding on "Screw Propellers" Mr. P. Y. Brimblecombe remarked that screw propellers being a factor of great importance in the propulsion of ships, innumerable calculations had been made and experiments performed with a view to determining their most efficient form. He went very exhaustively in the course of his remarks, into the theory of propeller construction and work, and gave his audience the benefit of many useful formulae in connection therewith.

He then proceeded to refer to the phenomenon known as cavitation. If, he said, a ship's propeller was worked at gradually increasing revolutions and producing gradually increased thrust, it was found that, beyond a certain point, there must be a marked increase in the number of revolutions required to produce a very moderate increase of thrust—i.e., the apparent slip showed a sudden increase. That had been attributed to the formation of cavities, principally at the back of the propeller blade, so that the propeller was working to some extent in a partial vacuum.

Mr. Barnaby considered that the phenomenon was due to an attempt to produce too large a thrust for the area of the blades, the maximum possible being about 11¼ pounds per square inch, while Naval Constructor Taylor, of the American Navy, considered that Barnaby's explanation was incomplete, and suggested that the two main factors in cavitation were the speed of the blade through the water and the shape of the blade section. The former could be conveniently measured by tip speed, and that should be kept as low as possible, consistent with the other factors having reasonable values. The limit of tip speed was about 12,000 feet per minute.

Taylor's view was that the controlling factor in cavitation was the formation of cavities on the front of the face of the leading edge, due to the driving face, which increased with the increase of speed. He, therefore, suggested that the best way to avoid or delay cavitation was to make the blade as wide as possible, so that, if cascading occurred over

the leading portion, the water might get back on the trailing portion and deliver its energy as thrust; and the leading edge of the blades should be made as thin as possible, so as to delay or avoid cascading, and, in order to obtain the necessary strength for leading edge, he suggested casting ribs across the blade.

Deeper immersion of the propeller would also assist in eliminating cavitation, as, of course, the pressure of water would be greater. It was very important that a propeller should have sufficient immersion, since, if it broke the surface of the water, its efficiency would be reduced considerably, and the greater the depth of the screw below the surface the less was the chance of its being drawn out of the water by pitching or rolling.

Blade Material

The materials of which propeller blades were made included cast iron, cast steel, forged steel, and manganese or some other strong bronze. Cast iron was used for the blades of propellers which worked under conditions rendering them very liable to strike against obstructions. When so striking, the cast iron being weak, the blade broke, and by so breaking saved the shafting of the engine. Its disadvantages were extreme corrosion in seawater, heavy blade sections and blunt edges. Cast steel was stronger than cast iron, but had the same disadvantages, although in a lesser degree. Manganese bronze and other strong bronzes appeared to be all that might be wished for in propeller material. They were of high strength, permitting a low ratio of thickness to width of blade, while they could be brought to a sharp edge, and were subject to comparatively little corrosion. They were also cast without difficulty, giving blades free from porosity and blow-holes. They would, however, exercise a strong corrosive action on a steel hull, unless zinc plates were fitted in their vicinity. Hubs were usually made of cast iron or semi-steel for cast iron or cast steel propellers, and of manganese bronze for manganese bronze blades.

Propeller Efficiency

The efficiency of a propeller varied inversely as the number of blades—i.e., a propeller with two blades was more efficient than a propeller with three identical blades, but the total thrust and torque increased as the number of blades was increased, although the thrust and torque per blade fell off. In practice, the number of blades was decided by considering the efficiency of resulting propellers, it being remembered that a four-bladed propeller might be smaller than a three-bladed, and hence have a

pitch ratio more favorable to efficiency than the pitch ratio of the corresponding three-bladed propeller.

Though there was little direct information on the subject, it was probable that single screws were more efficient than twin screws, and that there was a progressive disadvantage in using triple and quadruple screws. The differences were not large, however, and any type under favorable conditions might be more efficient than others for which favorable condition could not be secured. The single engine was, of course, simpler and cheaper than two engines with the same power, and, in like manner, two were cheaper than three or four. For moderate powers and speeds, a single screw would be chosen, unless there were distinct advantages, such as handiness or greater security from breakdown. For example, warships all had two screws or more, and turbine steamers had two, three, or four screws, for the better accommodation of the turbine.

Due to Propeller Action

A topic which was much discussed among laymen was that of a vessel's deviation from a straight course while the rudder was kept in a central position. That circumstance was due to propeller action. The speed of wake at the surface of the water was greater than that at the keel—consequently the upper blade experienced more resistance than the lower, and tended to drive the stem round. If the screw was right-handed and did not draw down air, it would tend to cause the vessel to carry a starboard helm in order to maintain a course. If there was air in the wake, caused, for example, by the vessel being at a light draught of water, the effect was reversed, the lower blade predominated, and a port helm must be carried.

The odds in the present naval struggle may probably be expressed pretty accurately—so far as material goes—in terms of weight of heavy gunfire. Including the two battleships just taken over, the British forces in the North Sea on the declaration of war mounted 142 13.5-inch guns and 306 12-inch guns. These weapons have an aggregate fire delivery respectively of 297 tons and 116 tons of metal. The German High Sea fleet on the declaration of war mounted 108 12-inch guns and 126 11-inch guns, respectively discharging 39.3 tons and 30 tons of projectiles.

The Bureau Veritas reports that during the month of June 287 steamers and 69 sailing vessels met with accidents, and that the number of vessels lost were 15 steamers of 25,273 tons and 22 sailing vessels of 7,156 tons.

Handicaps to Ship Building

Handicaps to progress in the shipbuilding industry were referred to at length in an interesting paper on "Shipbuilding Practice of the Present and Future," which was read before the Institution of Naval Architects at Newcastle recently.

"Methods of manufacture," said Mr. T. G. John, the author of the paper, "restrict the ambitions of the designer to certain narrow grooves from which he can expand but little. From this point of view it must be admitted that the improvements in appliances and methods of shipyard practice throughout the shipbuilding world in recent years have scarcely kept pace with the very great expansion of the industry.

"Although in output, cheapness, and quality of work Great Britain still maintains its superiority in face of competition from other nations," added Mr. John, "our shipbuilders have had to recognize during recent years the fact that several large Continental and American establishments have been extensively developed and equipped with very efficient plant, and that they will in future enter more largely into competition with ourselves. This has had a stimulating effect, but to a certain extent we have suffered handicap in this direction. Having been the pioneers of the iron shipbuilding industry, our establishments were formed and our methods developed when competition was much less severe than it is today or is likely to be in the future. The close connection, too, which exists between methods and working customs, especially at the present time, limits very considerably the abilities of shipbuilders radically and quickly to alter existing practice."

Such developments as have taken place are attributed by Mr. John to the increase in dimensions of ships built and the ever-persistent desire for economy. New methods of manufacture have influenced the developments to a comparatively small extent.

Dealing with the alternations in the topography of the shipyard, it was pointed out that there existed in this country but one roofed-in building in which a modern battleship or liner could be built, and that except in one or two instances where concrete had perforce to be used as an adjunct to piling to obtain a safe foundation, the average shipbuilder still constructed his ships without the luxury of a concrete or granite slipway, although it involved him in considerable more trouble in fairing them in carrying out their launching arrangements.

Summarising the improvements in general plant and appliances, Mr. John referred to the increasing demand for

bending rolls capable of working large plate. Nine years ago, he said, a roll capable of bending a plate 30 feet long by 2 inches thick was considered generally sufficient to meet future needs. Today plates up to 40 feet in length and 11 feet in breadth were being incorporated in ship's construction.

Professional opinion after 17 years' experience was still far from unanimous on the subject of pneumatic riveting, but most shipbuilders agreed that, given efficient "holding-up," pneumatic riveting in the hands of a moderately skillful workman was at least equal in quality to, and frequently excelled, hand work. An added virtue possessed by all pneumatic tools existed in the fact that in the hands of an otherwise inferior workman they could be made to give quite a good quality of work, which in times of scarcity of labor might otherwise be lost. A plea for simplification in the matter of operative power was followed by the suggestion that electricity seemed the most suitable prime energy for unification. Already it was possible to purchase electrically operated riveting hammers and hydraulic riveters actuated by a self-contained electrically driven pump.

Present-Day Weaknesses

Three presumptions regarding the future were considered by Mr. John to be "fairly positive." The size of certain types of ships, he said, will continue to expand. Economic competition will increase in severity, and will become world-wide.

It was scarcely reasonable, said the author, to assume that the steel ship of today would be the prototype as regards the structural details of the ship a century hence. It was equally certain that the weakness of the ship today was to be found mostly in its smaller details. It might therefore be expected that many efforts in the future would go towards the improvement of structural details and of the methods by which such details were manufactured.

The rivet and the water-tight bulkhead were used to illustrate this point. "The rivet," said Mr. John, "is certainly a very positive method of connection, but there exists with it a multitude of small added weights, and a non-uniformity of strength and elasticity throughout the entire structure. A casual study of the typical water-tight bulkhead causes one to realise the necessary crudity of its design and construction in association with the vital functions which it has to perform."

A great need existed in shipbuilding practice for the adoption of a reliable fusion process for connecting structural material. It was not difficult to see that non-uniformity of strength was principally due to the rivetted forma-

tion. Oxy-acetylene welding had given up to present very poor results when applied to the ordinary materials of hull construction, and the electric arc when used on detail work also had given until recently very indifferent results. A patented process, however, had lately been evolved which promised better results. This might be described as an electric fusion process, in which the weld was obtained by the addition of molten metal. Experiments, so far as they had gone, and allowing for want of experience on the part of the operators, showed the ease of operation, the comparative cheapness of the process, and the efficiency of the results. Sooner or later a process of this nature would exert a considerable influence over future shipbuilding practice.

In conclusion, Mr. John suggested that it was not even certain that steel, at least as we knew it, would be the material to be used in ships of the more or less distant future. The science of metallurgy had made such rapid strides that it was reasonable to assume that sooner or later a metal might be evolved possessing all the good characteristics of present-day steel in an accentuated form, and in addition be less liable to corrosion.

An Interesting Sidelight

An interesting sidelight on the European conflict was the effort of Herr Ballin, the chief figure in German shipping and personal friend of the Kaiser, to avert war. He interrupted a cure at Kissingen and went to London on June 23 ostensibly to conduct negotiations for the acquisition of oil fields in California. In reality his visit was to consult with Lord Haldane, Sir Edward Grey and Winston L. S., Churchill. He discussed the situation with them, and on return to Germany a special messenger from Berlin was sent through the German lines with a dispatch for Lord Haldane.

No one realizes more than Herr Ballin the critical condition in which the German mercantile marine now is, because even with the cessation of hostilities it will be many years before it recovers its recent prosperity, if ever it does so. On the German register there are 2,019 steamers of 4,743,046 tons gross, most of them of modern construction, the tonnage owned by the Hamburg-American Line and the North German Lloyd being just about half of that aggregate, while no fewer than 25 fine liners were being built for them. All the German members of the staff have rejoined the army, and Count Wengsky, its representative, left London last week a broken-hearted man. He is captain in an infantry regiment.

Our Merchant Marine

By Judge C. C. Goodwin

When our great Civil war came the tonnage of the ships of the United States exceeded that of any other power including Great Britain.

Four years later it had been swept away, either through the privateers fitted out in England or by transfers to foreign flags. In those four years, too, the material for building ships had been changed from wood to steel and the compound marine engine had so reduced the bulk and cost of fuel for ships, that even cheap products were carried in steamships and the wooden sail ship had become almost obsolete.

Great Britain took her old place as the commanding power on the ocean and has maintained it though in the meantime Germany had become a strong rival.

In the meantime, too, the Congress of the United States has refused to take

the world, it would be giving a million of men fair wages that would at once be going into the active money circulation of the country.

Neither can our "statesmen" comprehend that an ample merchant marine would place our people in direct accord with the nations, and all their opportunities would be open to our people.

But all that does not count with our statesmen. It is like the merchant that has a big store but refuses to own a delivery wagon lest the grain and hay merchant down the street might get rich selling hay and grain for his horses.

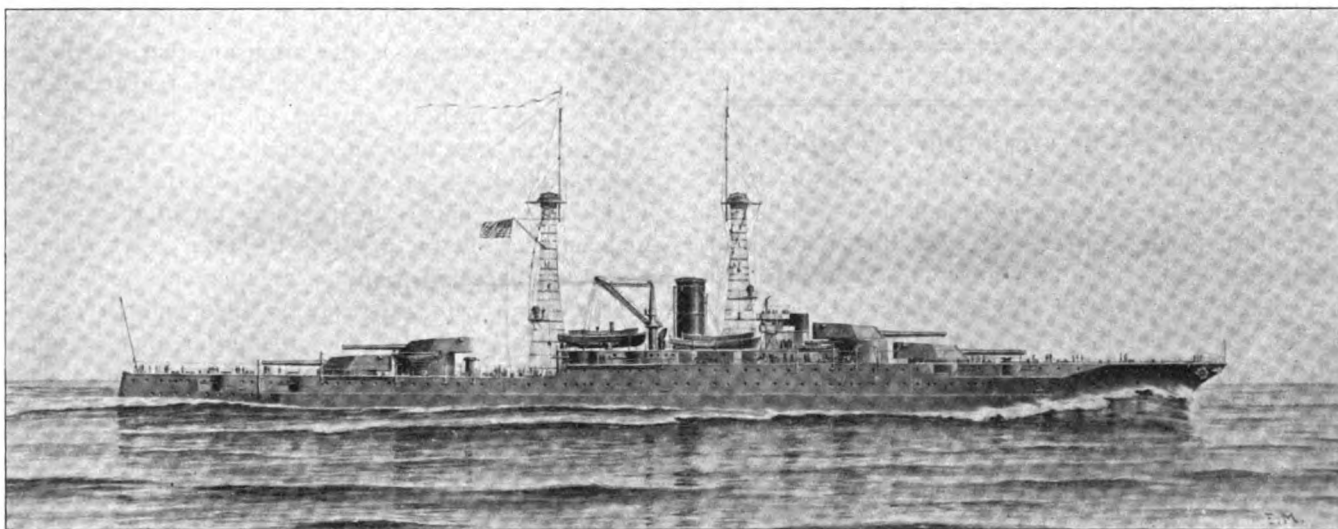
Battleship California

The navy department furnishes a sketch of the battleship California, construction of which was authorized by Congress on June 30th last. The limit of cost, exclusively of armor and armament, is to be \$7,800,000 and the total cost will be about \$14,920,000. The gen-

for a big increase in passenger and also freight business. In the passenger business the Japanese lines have practically a free hand, as the C. P. R. service has been completely upset by the charter of the Empresses for government service on the other side of the Pacific. Much of the trans-Pacific passenger travel that was formerly handled by the Nippon Yusen Kaisha and the Osaka Shosen Kaisha was diverted to C. P. R. channels following the advent of the newer Empresses. With the larger Empresses temporarily out of commission, it is expected that this business, both European and Oriental, for a time at any rate, will revert back to the Japanese lines.

Germany's Possessions

Germany's possessions in China and the Pacific, threatened by the entrance of Japan into the European war, con-



UNITED STATES BATTLESHIP CALIFORNIA AND CLASS

one step toward restoring our ocean prestige, though it has looked on and seen our country pay to foreign ships in fares and freights a steadily increasing sum until it now reaches \$300,000,000 per annum. In the past 15 years it has amounted to more than the whole wealth of any one power of Europe with perhaps four exceptions.

It would seem as though the present would be an opportune time to begin the rehabilitation of our merchant marine, but we have no hope that any sensible steps to that end will be taken. At least up to date the examples of nations that have grown rich through their ships has counted for naught with our statesmen; neither has the fact that what is paid by our country to foreign ships is lost to our country forever, had any effect on our statesmen; neither has the further fact that had we a merchant marine commensurate with our place in

eral dimensions are as follows: Length on water line, 600 feet; length over all, 624 feet; breadth, molded, 97 feet; draught, about 30 feet; displacement, about 32,000 tons; speed, 21 knots. The battery consists of 12 14-inch guns, four submerged torpedo tubes and 22 5-inch rapid fire guns. The propelling machinery will be turbines with boilers of the watertube type, oil-burning. The complement of officers and men is 1,056.

Looking for Harvest

All Japanese lines expect to reap a transportation companies whose services have become more or less demoralized since the declaration of war by England against Germany. Now that the services of other lines on the Pacific have been partially disrupted by the charter of vessels for naval service, representatives of the Japanese lines are looking

sist of Kiau-Chau, a protectorate in northwestern China on the Yellow Sea; and in the Pacific, German New Guinea, composed of Kaiser Wilhelm's Land, the Bismarck Archipelago, the Caroline, Palau, Marianne, Marshall and the Samoan Island of Savaii and Upolu. These islands, apart from the Samoan, have an area of 86,160 square miles and a population of 357,800, while Kalu-Chau has an area of 200 square miles and an estimated population of 168,900. The first of these possessions were acquired in 1884 and the last in 1899. The two Samoan islands belonging to Germany have an area of 1,000 square miles. These are the most important of the Kaiser's Pacific possessions, in consequence of their strategic position and the fertility of their soil. Apia, the principal port, has regular steam communication with New Zealand and Canada.

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October, 1914

Going After Germany's Trade

There is published elsewhere in this issue an article dealing with the organized efforts that the British government is making to secure for British manufacturers the oversea trade which was largely in the hands of Germany and Austria Hungary prior to the breaking out of present hostilities. The promptitude with which Great Britain has set about this business is very characteristic and is one which it would be well for the United States government to heed. In fact, the United States should lose no time in furthering the example set by Great Britain. The field is an open one and will be won by that nation which exhibits the greatest diligence and intelligence. All things considered, the advantage lies with the United States in capturing this trade because it is not hampered with shortage of labor, congestion of railways and the withdrawal of ships from which the belligerent nations, notably England, are now suffering.

Notwithstanding the strain of war, the British people are going after trade as though nothing was happening in the world at all. The board of trade is systematically arranging into groups all the articles that it has hitherto imported from Germany and Austria and is making a systematic inquiry to determine which of these articles it can manufacture itself to advantage and which can better be supplied by neutral nations. There is nothing haphazard about it. The government is apparently going to the length of supplying individual firms with useful information concerning trade openings through the mail. An immense amount of information of a practical nature is being collected from consular offices and other government officials and is being arranged for the use of British

manufacturers. A document is being devoted to each trade and they are being issued at the rate of three a day, which is, all things considered, a very remarkable performance.

Germany's export trade throughout the British empire has been thoroughly dissected and has undergone almost microscopic scrutiny. There is no such co-ordination in this country between government and business, but there should be. The United States can well afford to take a lesson from Great Britain on the subject of trade development through the employment of government agencies. We should drop these senseless investigations of our internal affairs and devote our energies to the exploitation of foreign markets. An institution in this country similar to the British board of trade would be a very good thing to have.

Admitting Ships to American Register

President Wilson has by virtue of the authority granted him by the bill recently passed by Congress admitting certain foreign-built ships to American register, suspended two sections of the navigation act. The first of these sections is the provision that watch officers of vessels of the United States registered for foreign trade shall be citizens of the United States. This section was suspended and it is ruled that all foreign-built ships which shall be admitted to United States registry under the act may retain the officers employed thereon for a period of seven years without regard to citizenship. Any vacancy among such watch officers within two years may be filled without regard to citizenship but any vacancy thereafter must be filled by watch officers who are American citizens. The other provision suspended is that requiring survey, inspection and measurement by officers of the United States of foreign-built ships. That provision is suspended for two years.

About 200 ships which are owned by American citizens but are now flying foreign flags may come under American register at once and resume business without a change of watch officers. Several companies will take immediate advantage of the act and there is no reason as far as anyone can foresee why our export trade should not again begin to move. Nearly all these vessels have heretofore been flying either British or Belgian flags and it is presumed, of course, that their officers have been getting the common rate of wages that are paid for their respective positions under these flags. It is not expected that their pay will be advanced to the scale usually paid on American vessels and it would seem as though the gate had been opened to them to see what they can do in open competition in oversea trade. They should possess, for the time being at least, many advantages. They are sailing under the neutral flag of a powerful nation and can safely engage in commerce to neutral ports. They will also be able to do a considerable business with the belligerent nations as a number of the ships of the fighting nations have been withdrawn for auxiliary

purposes. The dealings with these nations should be greatly facilitated by the war insurance risk which the government is carrying. A widely organized campaign should now be carried on for South American trade for this is a field in which the least disturbance is to be feared. Our bankers should now supplement the work of our manufacturers by extending banking facilities through branch banks in all South American countries. The present European conflict should mean a great deal to us in a commercial sense though others are paying a sorry price for our advantage.

The European Conflict

The world-wide topic today is the European conflict. It is discussed everywhere and frequently to the exclusion of any other subject; yet scarcely two months ago no one would have dreamed that such a conflict was possible. It has already proved conclusively the fallacy of the assertion that the preservation of peace depends upon preparedness for war. This war would never have occurred were it not for the marvelous military machine which Germany has built during the past twenty years and which is now at the very apex of perfection. No one is competent to discuss the causes of this war, or to put the blame where it properly belongs, unless he has read the White Papers of Great Britain and Germany. Great Britain submitted her case promptly to the people by the publication of all the documents that passed between her and the various powers. Germany immediately followed suit and both of these papers may now be obtained from any news stand for a nominal sum. One cannot read these papers without becoming convinced that Germany was behind Austria's ultimatum to Servia and was the one nation that declined to mediate even when all the other powers, including Austria, were willing to do so. There is only one conclusion to be reached and that is that Prussian militarism has driven the German people into war. There is no doubt whatever that the great mass of the German nation did not want war. Why should they? Their prosperity has been abounding during the past twenty years. The evidence is conclusive, however, that the Prussian war party wanted war and they got it. There is no question however that at this moment the whole of Germany is a unit for the war; the German people now believe that all the world is against them and that they are fighting for their very existence. They believe they are fighting a war of defense whereas in point of fact, as everyone knows, it is a war of aggression, deliberately planned by the great Prussian war party.

Anyone who reads the British White Paper knows to what length Sir Edward Grey went to preserve peace. Not until the very last minute did he abandon the hope of peace and in order to lend strength to his plea for an amicable settlement he had already made it quite plain to Germany that if the neutrality of Belgium should be violated England would be drawn in. If one were to attempt to put one's finger upon any

one person more responsible for the war than any other he would select the German ambassador at Vienna. He made rebuffs to Sir Edward Grey's advances at every step and has now proved to have been familiar with the Austrian ultimatum to Servia before it was sent and he endorsed every word of it. He wanted war from the beginning and was one of the great obstacles in the way of peace. There is no doubt whatever that the Kaiser himself was mightily surprised when England declared war against Germany. It was one of the things that he did not expect and it has undoubtedly troubled him greatly ever since. For ten years past the relations between Germany and Great Britain have been most cordial and there is every reason why they should be so as both nations have practically sprung from the same stock. The aim of German diplomacy for a decade has been to maintain a state of the utmost friendliness and understanding with Great Britain, but her diplomats entirely misread the British character if they thought for a moment that bribes or threats or any commercial advantage would cause them to break a written promise. Nations are measured by the times through which they pass and posterity is the judge of their conduct. England would have gone down into history covered with shame if she had failed to protect her little neighbor; but she will be remembered forever as the nation that went to war on account of a scrap of paper. Those who are acquainted with the temper of the British people know that this war will have only one ending no matter what it costs. It will not cease until Prussian militarism is crushed. This war is in fact a struggle of democracy against a military aristocracy that must be swept away forever. The military system of Prussia has no place in modern times. It is a relic of medievalism.

"The expeditionary force as detailed for foreign service has been safely landed on French soil. The embarkation, transportation and disembarkation of men and stores were alike carried through with the greatest possible precision and without a single casualty."

In that brief statement was announced the safe landing of British troops in France. During the two weeks that the transports were busy in this work not a single line concerning the affair was published in a British newspaper. Of course, such a movement could not possibly have been carried out without many knowing of it, as down all the roads through Kent and Hampshire great trains of transports and artillery were rumbling day and night. No one, however, asked any questions; the King's farewell telegram to the troops at Southampton was never published; and not a word leaked out from any source whatever until the last man was safe on French soil. The most impressive silence has been maintained as to names and places ever since. So well are the British army's movements kept secret that villages only five miles off the road of advance are unaware of its presence.

Welfare on Lake Vessels

The Welfare Plan Committee of the Lake Carriers' Association held a meeting on Wednesday, Aug. 26, in the office of J. H. Sheadle, vice president of the Lake Carriers' Association. The purpose of the meeting was to review the work of the past month and to plan for the future. Safety has been the keynote of the association in its dealings with the men aboard ship during the present season. Metal signs with lettering in white upon a blue background and containing a red disc have been prepared and distributed to practically all of the boats. A few deliveries, however, are awaiting more specific directions. To promote sanitation, drinking fountains were established as an experiment in a number of assembly rooms and were found to work quite satisfactorily. The committee thereupon ordered them installed in all the assembly rooms in the association.

Last spring the sanitation committee sent a circular to all the supply houses having dealings with the vessels indicating the manner in which foodstuffs intended for consumption aboard ship should be handled. This circular, which was published in the June issue of THE MARINE REVIEW, went into considerable detail. Since then an investigation has been made of all of the supply houses which are patronized by the vessels and in general they were found to be in satisfactory condition. There are some, however, that are not up to standard, but they will be given a further opportunity to meet the wishes of the association. The association will not discriminate against anyone, but it is naturally desirous that its vessels trade at the best places. The places which are not up to standard will not be recommended, or to quote W. E. Lloyd, "We will get them all into line, if we can; if they won't get into line, why that's their own lookout."

Obviously during the course of the month a great many suggestions fell into the hopper and the committee gives all of them consideration. A suggestion that the galley should be inspected daily by some one delegated by the captain for that purpose was not approved. It was held that this was the captain's duty exclusively and that he had ample time to make the examination. It was also suggested that meat chopping machines be installed in the galley. While this was not specifically endorsed, it was held that the steward should cut up all meat for hamburger steaks, chile conarni, etc., and not buy meats for this purpose already cut up in the

stores, though it was not the thought that the steward should be hindered in buying sausages and such other food. It was emphatically recommended that tomato cans once opened should never be used for any purpose again.

Upon the suggestion of installing a steam pipe in the galley to scald the milk cans before returning them to the milk dealer, the committee was somewhat divided, some believing that they could be scalded with boiling water just as well, while the steam pipe might have a tendency to uncomfortably steam up the galley. It was admitted, however, that it would be much more convenient to steam the cans than to pour boiling water into them.

Some of the assembly rooms are filling up with unclaimed baggage and it was decided to prepare a new check limiting the storage of baggage to two years. If not called for at the expiration of that period the baggage will be disposed of after inventory.

Ninety per cent of the crews shipped during the present year are members of the welfare plan, an increase of 6 per cent over last year. Tentative plans are now being made for night schools to be conducted by the Lake Carriers' Association for the benefit of the men during the coming winter. Announcement will be made of these plans later.

Free Instruction in Navigation

The Cleveland branch hydrographic office, formerly located in the Old Arcade, has been established for the past two years in the Federal building, next door to the United States Steamboat Inspection Service. The office is in charge of an officer of the United States navy, who is assisted by a nautical expert of many years experience.

While many mariners visit the hydrographic office for information and instruction, a great many more who might take advantage of the facilities of the office are evidently ignorant of the fact that all services are rendered without charge.

The office has a full set of hydrographic and lake survey charts covering all the waters of the Great Lakes, together with sailing directions, notices to mariners and hydrographic bulletins. These publications are available not only for the latest information but for the study of navigation generally.

The office also maintains a time service in conjunction with the United States naval observatory. Correct standard time is furnished

mariners, chronometers are rated and nautical instruments in general are corrected and adjusted.

The office is particularly well fitted with facilities for giving practical and theoretical instructions in compass compensation, chart work piloting, nautical instruments and deep sea navigation. The hydrographic office would be glad to give individual instruction or form classes for the benefit of any men who are desirous of making a study of any of the branches of navigation. Mariners generally, whether licensed or not, are cordially invited to make use of the facilities offered by the Cleveland branch hydrographic office.

August Lake Levels

The United States Lake Survey reports the stages of the Great Lakes for the month of August, 1914, as follows:

Lakes	Ft. above mean sea level
Superior	602.76
Michigan-Huron	580.64
Erie	572.59
Ontario	246.33

Lake Superior is 0.08 foot higher than last month, 0.02 foot lower than a year ago, 0.10 foot above the average stage of August of the last ten years, 1.17 feet below the high stage of August, 1876, and 1.16 feet above the low stage of August, 1879. Average stages of the last ten years indicate that the September level will be 0.1 foot higher.

Lakes Michigan-Huron are 0.10 foot lower than last month, 0.58 foot lower than a year ago, 0.42 foot below the average stage of August of the last ten years, 2.87 feet below the high stage of August, 1876, and 0.70 foot above the low stage of August, 1911. Average stages of the last ten years indicate that the September level will be 0.2 foot lower.

Lake Erie is 0.24 foot lower than last month, 0.65 foot lower than a year ago, 0.12 foot below the average stage of August of the last ten years, 1.52 feet below the high stage of August, 1876, and 1.21 feet above the low stage of August, 1895. Average stages of the last ten years indicate that the September level will be 0.3 foot lower.

Lake Ontario is 0.39 foot lower than last month, 0.98 foot lower than a year ago, 0.44 foot below the average stage of August of the last ten years, 1.93 feet below the high stage of August, 1862, and 1.98 feet above the low stage of August, 1895. Average stages of the last ten years indicate that the September level will be 0.4 foot lower.

Commerce of Sault Canal

The August movement of freight through the canals at Sault Ste. Marie was the heaviest of the year, totaling 8,934,986 tons as against 8,830,256 tons for July. The movement during July, 1913, was 12,278,124 net tons and during August, 1913, was 11,489,442 net tons. The slump during August was due to the strike on the ore docks. The total movement of freight to Sept. 1 of the present year through the canals was 34,615,959 tons as against 49,162,920 tons for the corresponding period last year, a decrease of 14,546,970 tons. Following is the summary:

EAST BOUND.			
	To Sept. 1, 1913.	To Sept. 1, 1914.	
Copper, net tons.....	65,931	40,278	
Grain, other than wheat, bushels.....	55,241,355	32,355,517	
Bldg. stone, net tons.....	5,973		
Flour, barrels.....	5,315,495	5,144,212	
Iron ore, net tons.....	30,782,186	20,633,194	
Pig iron, net tons.....	18,348	11,575	
Lumber, M. ft. B. M.....	359,491	288,283	
Wheat, bushels.....	72,096,467	59,976,153	
Unclass. frght., net tons.....	267,802	169,863	
Passengers, number.....	31,288	24,499	

WEST BOUND.			
	To Sept. 1, 1913.	To Sept. 1, 1914.	
Coal, anthracite, net tons.....	1,809,401	1,426,591	
Coal, bituminous, net tons.....	10,553,201	7,990,621	
Flour, barrels.....	763	517	
Grain, bushels.....	400		
Mixed iron, net tons.....	219,921	162,332	
Iron ore, net tons.....	32,376		
Salt, barrels.....	448,272	496,108	
Unclass. frght., net tons.....	723,991	662,227	
Passengers, number.....	34,276	27,225	

SUMMARY OF TOTAL MOVEMENT.			
	To Sept. 1, 1913.	To Sept. 1, 1914.	
East bound, net tons.....	35,656,964	24,300,139	
West bound, net tons.....	13,505,965	10,315,820	
	49,162,929	34,615,959	
Vessel passages.....	14,290	11,860	
Net registered tonnage.....	35,074,194	26,598,745	

Lake Erie Ore Receipts

Out of a total movement of 5,869,477 gross tons of ore during August, 4,740,243 tons went to Lake Erie ports distributed as follows:

Port.	August, 1914.
Buffalo.....	587,869
Port Colborne.....	46,641
Erie.....	45,003
Conneaut.....	1,113,088
Ashtabula.....	964,511
Fairport.....	302,552
Cleveland.....	1,094,914
Lorain.....	267,916
Huron.....	107,315
Sandusky.....	
Toledo.....	118,078
Detroit.....	92,356
Total.....	4,740,243

Ore Shipments During August

The August ore movement was but slightly in excess of the July movement, though it was confidently expected in the trade that it would pass the 6,000,000-ton mark. However, it only reached 5,869,447 tons as against 5,748,514 tons for July. It is expected that the September movement will be practically equivalent to the July and August movements. During last year the fleet moved 7,258,413 tons in September, 6,521,884 tons during October and 3,283,110 tons in November. During the past three months the

movement has been running approximately 1,800,000 tons per month less than the corresponding movement last year, and this proportion will probably obtain during the months of September and October. Figured on this basis, the movement to November 1 of the present year would work out at about 31,750,000 tons, as the movement to September 1 of the present year totalled 21,278,107 tons. During November, 1913, 3,283,110 tons of ore were moved, but as there is expectation of an early close, the November movement this year will probably not be much over 2,500,000 tons. This would make the total movement for the season about 34,250,000 tons. Following were the shipments during August, 1914 and up to September 1, with the corresponding data for the preceding year:

Port.	August, 1913.	August, 1914.
Escanaba.....	964,288	724,951
Marquette.....	598,861	368,430
Ashland.....	809,597	662,951
Superior.....	1,519,109	1,886,418
Duluth.....	1,957,239	1,203,081
Two Harbors.....	1,835,191	1,023,646
	7,684,285	5,869,477
1914 decrease.....		1,814,808
Port.	To Sept. 1, 1913.	To Sept. 1, 1914.
Escanaba.....	3,623,632	2,465,692
Marquette.....	2,155,363	1,049,791
Ashland.....	3,073,628	2,079,776
Superior.....	8,592,522	7,576,831
Duluth.....	7,891,903	4,152,367
Two Harbors.....	6,676,708	3,953,650
	32,013,756	21,278,107

Naval Expenditures and the Nation

Critics of the United States naval expenditure would do well to reflect that among all the great powers the percentage increase has been consider-

	Naval Estimates, 1904-5.	Naval Estimates, 1913-14.	Increase.	Increase, Per cent.
Great Britain.....	\$199,972,305	\$247,885,855*	\$47,913,550	24
United States.....	98,278,109	140,718,455	42,440,326	43
France.....	60,302,448	100,670,128†	40,367,680	67
Russia.....	58,196,042	118,643,820	60,447,778	104
Germany.....	49,211,350	112,037,576	62,826,226	127
Italy.....	24,350,000	50,633,851	26,283,851	108
Austria-Hungary.....	12,737,290	28,959,414	16,222,124	127
Japan.....	10,239,408	48,105,152	37,865,744	369

*Including supplementary estimate of \$12,672,366.

†Including \$10,515,139 taken from a special treasury account.

ably less in the United States than in the case of any of the other powers except Great Britain. The following statement will illustrate this fact:

Our Manifest Destiny

Among the legends of our late Civil War there is a story of a dinner-party given by the Americans residing in Paris, at which were propounded sundry toasts concerning not so much the past and present as the expected glories of the great American nation. In the general character of these toasts geographical considerations were very prominent, and the principal fact which seemed to occupy the

minds of the speakers was the unprecedented *bigness* of our country. "Here's to the United States," said the first speaker, "bounded on the north by British America, on the south by the Gulf of Mexico, on the east by the Atlantic, and on the west by the Pacific Ocean." "But," said the second speaker, "this is far too limited a view of the subject; in assigning our boundaries we must look to the great and glorious future which is prescribed for us by the Manifest Destiny of the Anglo-Saxon Race. Here's to the United States—bounded on the north by the North Pole, on the south by the South Pole, on the east by the rising and on the west by the setting sun." Emphatic applause greeted this aspiring prophecy. But here the third speaker—a very serious gentleman from the Far West. "If we are going prophecy. But here rose the third "to leave the historic past and present, and take our manifest destiny into the account, why restrict ourselves within the narrow limits assigned by our fellow-countrymen who has just sat down? I give you the United States—bounded on the north by the Aurora Borealis, on the south by the procession of the equinoxes, on the east by the primeval chaos, and on the west by the Day of Judgment!"

First Foreign Vessel Through Panama

The Daldroch, a cargo steamer, belonging to J. and M. Campbell of Glasgow, Scotland, loaded with 11,500 tons of wheat arrived at Balboa on Thurs-

day, August 20, and passed through the canal bound for Limerick, Ireland, on Saturday, August 22. It left Tacoma, Washington, on the day of the outbreak of hostilities in Europe, intending to sail around South America. At Cape San Lucia, the captain received a radio message instructing him to use the canal, which will probably effect a saving of about 40 days in its voyage.

Eight vessels passed through the canal southbound, and seven northbound, during the week ending 8 a. m., August 22.

The Alexander seamen's bill has finally been pigeon-holed by the committee on merchant marine and fisheries.

Grain Shortages

Lake Vessel Owners are Now Determined to Settle One of the Most Annoying Features of the Trade

THE subject of grain shortage on the lakes is now being seriously attacked by the vessel owners jointly. A meeting was held in Buffalo on Sept. 3 between committees representing the Lake Carriers' Association, the Dominion Marine Association, and the Association of Lake Lines, presided over by Mr. Fred E. Signer who is the commissioner for the Association of Lake Lines. The Lake Carriers' Association was represented by President William Livingstone, Harvey D. Goulder, counsel; A. E. Cornelius, W. H. McGean, Herbert K. Oakes, Joseph Rodgers, A. E. R. Schneider and A. W. Thomson. The Dominion Marine Association was represented by H. W. Cowan, George Fair, Francis King and A. E. Matthews. The Association of Lake Lines was represented by E. T. Douglas, Charles M. Heald, Fred E. Signer, W. H. Smith, J. A. Stevenson and C. F. Strasmer.

Some Common Understanding

The purpose of the meeting was to arrive at some understanding on the subject of grain shortages. During the present season shortages have amounted to as much as 1 per cent of the cargo carried and the issue is obviously quite acute as the vessel has to pay for all shortages. Shortages have run as high as 800 bushels, which means that the vessel owner has had to pay out of his own pocket \$800. When it is considered that grain has been carried on the lakes this season for $\frac{7}{8}$ cents, out of which the vessel pays practically one-half cent for trimming and unloading, there is little left with which to pay for shortages. Vessel owners are by no means a unit on the subject as to how the case should be treated. Some of them want the responsibility for shortage eliminated altogether, holding it to be a natural incident of the grain trade which should be borne by the grain men. Others manifest a willingness to be responsible for a shortage which does not exceed one-quarter bushel per 1,000 bushels, or in any event not over one-half bushel per 1,000 bushels.

The actual shortages on all grains carried during 1913 was one-third bushel per 1,000 bushels. The 1913 report of Junius Smith, lake weighmaster at Buffalo who weighed 122,000,000 bushels out of the total of 192,000,000 bushels carried, shows a wheat shortage of

40,080 bushels and an overrun of 38,159 bushels, out of a total of 72,900,898 bushels carried. This works out at only two pounds per 1,000 bushels carried, and of course is quite a satisfactory showing as a whole, but the trouble is that certain vessel owners were penalized to the extent of \$40,080 while others received a bonus of \$38,159. The movement of corn was practically only one-fifth of the wheat movement but its shortages were infinitely greater in proportion. The corn shortage was 8,762 bushels with an overrun of 1,953 bushels, working out at 28 pounds per 1,000 bushels carried. The total shortage on all grains was 62,999 bushels and the overrun 46,791, averaging about 8 pounds per 1,000 bushels. This average would undoubtedly be satisfactory were it possible to distribute it pro rata among the ships that carried the grain, but unfortunately it falls upon individuals and occasionally with particular severity, as has been shown during the present year. What the vessel owners want is either to abolish shortages altogether or else fix a definite limit to them in the bill of lading.

The contention of the grain shippers all along has been that it is imperative that the bill of lading should be a bankable document and that if it calls for 400,000 bushels of grain, that amount or its equivalent in money should be delivered. Granting this contention, vessel owners cannot see why the shortages may not be insured by the shippers and collected from the underwriters when any shortage occurs.

One-eighth of One Per Cent

They also point to the fact that the railroads will only assume responsibility for a shortage which is over and above one-eighth of one per cent of the shipment. Flax is carried on a uniform bill of lading limiting responsibility to one-half bushel per 1,000 bushels, but the point is made that flax usually goes direct to the consumer whereas grain may pass through a dozen hands and the bill of lading through a dozen banks before it reaches the consumer. It is pointed out, however, that if one-half bushel in 1,000 bushels is a fair shortage for flax, which is very slippery and will go almost where water goes, it would be a very generous allowance for the other grains.

No conclusion was reached at the

meeting, but the following recommendation was approved:

"That this conference of representatives of the Lake Carriers' Association, the Association of Lake Lines, and the Dominion Marine Association, is unanimously of the opinion that there is no reason why the vessel should assume responsibility for discrepancies in the weights of grain cargoes, and that the grain bill of lading, instead of throwing this responsibility upon the carriers, should contain a clause by the terms of which the vessel will have no claim for overages in the out-turns of cargoes, will accept freight on actual out-turns, and will assume the responsibility for shortages, which shall not exceed in any event one-half bushel per thousand.

"That for the purpose of discussing with the shippers of the United States and Canada the adoption of a general understanding for such a bill of lading, and of taking such action as may be deemed advisable, a meeting be arranged by the chairmen of the three associations above named, to be attended by duly authorized representatives of these associations, and at which representatives of the shippers shall be invited to attend and discuss the terms of the proposed understanding.

"And that when the said meeting is arranged copies of this recommendation be communicated to the various Grain Exchanges and Boards of Trade at lake shipping centers in both countries, with the request that they appoint representatives accordingly."

The Cullen Barge Corporation, 1 Broadway, New York city, has purchased the entire fleet of the Harbor Transportation Co., also of 1 Broadway, consisting of eight coal barges. These have been merged with the fleet of the Cullen Barge Corporation and they bring the total of barges and scows purchased by this corporation during the past 30 days, to 11. The transfer was effective Sept. 1. The Cullen Barge Corporation operates in New York harbor, Long Island sound and the Hudson river.

The steamer Moldegaard of the Ocean Freight Line is the first coal carrier to come in under the American flag under the new Ship Registry Bill. She is now engaged in carrying American coal to South American ports.

Good Work

As revealing the *esprit de corps* now prevailing on board the vessels of the Lake Carriers' Association the following letter from a master to his owner is quite illuminating:

Three-Hour Watch—Things have been going very well with us this summer. The three-hour watch is working splendidly; in fact I have had no trouble in working it the past two years.

Lookout—We keep the Lookout on the forward deck. Am satisfied this is the only place to have him located.

Inspection of Ship—The new regulation this year of having the ship in-

ter this year than before, I attribute the few changes on my boat to the fact that they are all saving money and they feel they have a sort of "place in the community" as it were.

In the spring our boys started a sort of navigation school in the forward hall; they have a full set of charts and apparatus to work with; the polaris we generally work together, and to show we have done something worth while, one of our wheelmen went before the local inspectors recently and got first-class papers for 4,000 tons. With a letter from me he got a second mate's place on a steamer and has gone with



TUG AMERICAN, BUILT BY JOHNSTON BROS., FERRYSBURG, MICH.

spected once each trip by the master, engineer and mate, is proving a great success. We choose a time when it is convenient for all of these officers and make a thorough examination of every part of the ship. I am surprised we did not start this plan years ago. Three can see so much more than one and it puts system into the practice.

Sanitation—I feel that the dealers are exercising more care in bringing their provisions aboard. The efforts of the Lake Carriers' Association have exercised a very wonderful effect. Following the directions from the office, I am making it a practice to visit the dealers with whom we deal and go through their establishments. The majority of them are kept in excellent shape, but I have found the following to be not all that could be desired. * * *

Crews—I have a splendid crew of men this year from top to bottom. I have changed only four men since I left in the spring. My crew have sent a lot of money to the bank. All one needs to do to get the savings habit started is for the captain and engineer to have patience, trip after trip, and encourage men to start, and when they start—my, it is wonderful what an interest they take in the matter. I feel amply repaid for what efforts I have put into it.

While of course crews are staying bet-

her. This idea of a "school" on the ship is simply an outgrowth of the improvement that has come among men.

New Harbor Tug

Johnston Bros., Ferrysburg, Mich., has just delivered to the American Construction Co. of Cleveland the tug American, 81 feet 6 inches long over all, 20-foot beam and 10 feet deep. The tug is of steel construction throughout, having accommodations for a crew of ten men and completely equipped with Dake Steam Steerer and the usual harbor tug outfit. The boiler is Scotch, 10 feet diameter by 11 feet long and allowed 150 pounds pressure. The engine is a fore and aft compound marine type with cylinder 14 inches and 30 inches diameter by 24-inch stroke.

Extensive improvements are being made at Vancouver, B. C., to accommodate the increasing business of the port. New government and private docks, wharves and dredging schemes are being planned and under construction, which will make the harbor one of the most modern on the Pacific. Vancouver is an all-year-round open port with ample anchorage space, many miles of deep water front, and perfect security from weather conditions.

British Board of Arbitration

Just prior to the outbreak of the European war, rules were promulgated and a Board of Arbitration appointed by the British government, of which Lord Mersey is the president, with the view of settling any disputes that may arise between the Admiralty and shipowners when vessels are called up. Endeavors are to be made by the parties concerned to come to agreement, but failing this, recourse will be to the president who then puts the claim before two arbitrators whom he may select from a panel, with instructions and their award if given shall be final, and in the alternative the president will act as umpire in the dispute and, his decision will settle the matter. The president is assisted by a panel of experts which includes shipowners, bankers, underwriters, marine insurance companies, insurance brokers and average adjusters.

Revision of Trade Routes

The opening of the Panama canal to commerce is likely to cause a general revision of trade routes, as some of the present highways of the sea will probably be deserted for new ones, which will result in new routes being put on maps and charts. The first readjustment of the world's trade route charts was made after the discovery of the Cape of Good Hope, and the second after the opening of the Suez canal, which brought commerce back to the Mediterranean ports that had been deserted after the discovery of the route around the Cape. With the present readjustment it is thought that the Azores, Bermuda and Barbados will again be placed on the main routes of trade so that it is expected the big carriers of the sea will seek their harbors. This will also be the case with the Gulf of Mexico ports and various Pacific coast ports.

To provide for the large increase in business which it is expected will follow the opening of the Panama Canal, a £300,000 cable is to be laid from New York to Colon, by way of Guanamao, before the end of the year. Later it may be extended to Brazil. The cable, which is being constructed in England for the Central and South American Telegraph Co., will be much larger than the present cable. The C. S. Colonia will leave England in November with the cable for New York.

The Phoenix Construction Co., New York, has been awarded the contract for the construction of the new terminal for the Ocean Steamship Co. at Savannah, Ga. Work will begin immediately and will be completed in about a year.

Ship Registry Act

An act to provide for the admission of foreign-built ships to American registry for the foreign trade, and for other purposes.

Be it Enacted, Etc., That the words "not more than five years old at the time they apply for registry" in section five of the Act entitled "An Act to provide for the opening, maintainance, protection, and operation of the Panama canal and the sanitation and government of the Canal zone," are hereby repealed.

Sec. 2.—That the President of the United States is hereby authorized whenever in his discretion the needs of foreign commerce may require, to suspend by order, so far and for such length of time as he may deem desirable, the provisions of law prescribing that all the watch officers of vessels of the United States registered for foreign trade shall be citizens of the United States.

Under like conditions, in like manner,

and to like extent the President of the United States is also hereby authorized to suspend the provisions of the law requiring survey, inspection, and measurement by officers of the United States of foreign vessels admitted to American registry under this act.

Sec. 3.—This Act shall take effect immediately.

The President's Order

The following executive order in respect to the ship registry act has been issued by the President under date of Sept. 4, 1914:

In pursuance of the authority conferred upon the President of the United States by section 2 of the act approved Aug. 18, 1914, entitled "An act to provide for the admission of foreign-built ships to American registry for the foreign trade, and for other purposes", it is hereby ordered:

1. That the provisions of the law prescribing that the watch officers of

vessels of the United States registered for foreign trade shall be citizens of the United States, are hereby suspended so far and for such length of time as is herein provided, namely: All foreign-built ships which shall be admitted to United States registry under said act may retain the watch officers employed thereon, without regard to citizenship, for seven years from this date, and such watch officers shall be eligible for promotion. Any vacancy occurring among such watch officers within two years from this date may be filled without regard to citizenship; but any vacancies which may occur thereafter shall be filled by a watch officer who is a citizen of the United States.

2. That the provisions of law requiring survey, inspection and measurement, by officers of the United States, of foreign-built ships admitted to United States registry under said act are hereby suspended for two years from this date.

WOODROW WILSON.

Will Not Remeasure Vessels

At the request of the Department of Commerce, Assistant Secretary of the Treasury Peters sent a letter to the collectors of customs directing them not to re-measure vessels built in certain foreign nations when presented for registry under foreign laws. The general letter is as follows:

"Merchant vessels of Great Britain, Belgium, Denmark, Austria-Hungary, the German Empire, Italy, Sweden, Norway, Spain, the Netherlands, Russia, Finland, Portugal, Japan and France will be deemed to be of the tonnage denoted in their certificates of register or other national papers, and it shall not be necessary for such vessels to be remeasured at any ports of the United States, the measurement laws of those countries being substantially similar to the laws of the United States (Act of Aug. 5, 1882).

"This regulation supersedes the department's regulations included in article 85, customs regulations, 1908, and so much of article 87 as may conflict with this order."

Measures to Preserve American Neutrality

Corrected regulations have been sent to collectors of customs to enforce the neutrality of the United States in shipments to belligerent European countries. The amended regulations are as follows:

"1. You will permit foreign bound vessels to clear only after they have



A SIGHT NOT USUALLY SEEN
THE STEAMER L. C. WALDO ON THE BOTTOM OF THE DRY DOCK AT
LORAIN

filed with you their full and final manifests.

"2. You will notify all merchant vessels in your district that they will be subject to inspection and examination of documents, ships and cargoes by United States authorities before clearance is given, and will be subject to further examinations by United States authorities after clearance and while such vessel remains within the territorial waters of the United States. Such vessels shall stop and lie to for examination when signalled by a United States vessel.

"3. Any foreign bound vessel whose character as a merchant vessel is established to your satisfaction is entitled to clearance (subject to the requirements of paragraph 1) no matter what the character of her cargo or what her destination.

"4. You will not refuse clearance to merchant vessels, whether of the United States or other neutral power, or whether of a belligerent power, solely on the ground that the cargo contains contraband of war.

"5. When a vessel of a belligerent power which has arrived as a merchant vessel alters or attempts to alter her status as a merchant vessel, or there is reason to believe she intends to alter such status so as to become an auxiliary cruiser or an armed vessel in any degree, you will immediately notify the department by wire, giving all particulars. Any of the following acts will continue such a change of status.

"(a) The placing in position or otherwise changing the location of guns which were on board the vessel at the time of her arrival.

"(b) So changing the appearance, color, rig or equipment of a vessel as to render her suitable for some purpose of war.

"(c) The taking on board of guns, arms or ammunition under circumstances which in any way indicate the outfitting of the vessel for any purpose of war or in aid of a military expedition.

"6. Should any vessel depart or attempt to depart from your district without a regular clearance you will wire the department and also the commander of the nearest naval vessel or revenue cutter.

"7. You will report by wire to the department and to the commander of the nearest naval vessel or naval station the arrivals and departures of all war vessels of foreign nations.

"8. In case of doubt wire the department for instructions.

"9. All telegrams relating to the foregoing and similar questions should be,

until further orders, addressed, 'Customs Division, Treasury Department, Washington, D. C.'

(Signed) "W. F. McADOO,

Secretary of Treasury.

"WILLIAM C. REDFIELD,
Secretary of Commerce."

Transfer to American Flag

Formal steps for the transfer under the American flag of the fleet of the United States Steel Corporation and of the United Fruit Co., in accordance with action previously foreshadowed, now are being taken. At Albany Sept. 9, the United Fruit Co. took out charters for 25 steamship corporations, each with a nominal capital of \$1,000. Each corporation will bear the name of a vessel of the fleet which is to be enrolled under American registry. This will represent the number of boats thus to be transferred by the United Fruit Co., which heretofore have been flying the British flag. These boats carry on business be-

rush, a British bark, now at Boston. The Moldegaard, jointly owned by the Ocean Freight line and the Coast Steamship Co., has completed registration.

Government Ownership of Trading Vessels

Congressman J. W. Alexander has introduced the following bill (H. R. 18373), which was referred to the committee on Merchant Marine and Fisheries:

A bill to authorize the United States government to establish and operate a steamship service between ports of the United States and ports of various countries of South America, and such other ports as may from time to time appear desirable, and to establish a service of value to the national defense in time of war.

Be It Enacted, Etc., That the United States of America is hereby empowered to establish and operate a line of steam-

VESSELS REGISTERED UNDER		THE ACT OF AUGUST 18, 1914.	
Name of vessel.	Gross.	Service.	Home Port.
Oceana	7,796	Passenger	New York, N. Y.
Moldegaard	2,852	Freight	New York, N. Y.
Robert Dollar	5,356	.....	San Francisco, Cal.
Windrush	1,531	.....	Boston, Mass.
Tivives	5,017	Passenger	New York, N. Y.
Trinidadian	2,450	Freight	Port Arthur, Texas
Roseway	291	.....	Mobile, Ala.
Santa Rosalia	5,409	Freight	New York, N. Y.
Kentra	4,682	Freight	New York, N. Y.
Bantu	4,188	Freight	New York, N. Y.
Crofton Hall	5,773	Passenger	New York, N. Y.
Annie M. Reid	2,165	.....	San Francisco, Cal.
San Francisco	5,102	Freight	New York, N. Y.
Buenaventura	4,881	Freight	New York, N. Y.
Charlton Hall	4,749	Freight	New York, N. Y.
Craster Hall	4,319	Freight	New York, N. Y.
Howick Hall	4,922	Freight	New York, N. Y.
17 vessels	71,483	gross	

tween the Atlantic seaboard of the United States and the West Indies and Central and South America.

The Steel Corporation is proceeding with the transfer of ten vessels. These boats are listed as having been operated by two different British companies. The Isthmian Steamship lines has controlled the Bantu, Santa Rosalia, San Francisco, Kentra and Buena Ventura. The New York & South American Steamship Co. has operated the Craster Hall, Charlton Hall, Howick Hall, Crofton Hall and Foxton Hall. These boats have been plying principally between Atlantic ports and South America. The title of these boats, when transferred, will be vested either in the United States Steel Products Co. or in a new subsidiary to be formed. The Steel Corporation has under permanent charter about 35 deep-sea vessels and many of these eventually—it is believed—will be put under American registry.

Applications for registry also have been made for the Robert Dollar of the Robert Dollar Steamship Co., now at San Francisco; the Oceanic, for which the application was made by the Morse Dry Dock Repair Co. and the Wind-

ships to trade between ports of the United States and ports of the various countries of South America, and such other ports as may from time to time appear desirable and to be available for use as naval auxiliaries in time of emergency; Provided, that no expenditures for this purpose, other than necessary expenses hereinafter referred to, shall be made until there has been prepared a complete report covering all details of the proposed scheme, with estimates of cost, and the same has been submitted to and approved by Congress.

Sec. 2.—That for the purpose of preparing this report the President of the United States is hereby empowered to appoint a commission consisting of three members of the House of Representatives, three members of the Senate, one official of the Department of Commerce, two officers of the navy, one of whom shall be a naval constructor and one an expert in matters pertaining to personnel, and two citizens not at present in the employ of the United States, one of whom shall be experienced in the shipping business and one in shipbuilding.

Sec. 3.—That for the purpose of de-

fraying the necessary expenses in connection with the preparation of this report there is hereby authorized to be appropriated the sum of \$25,000.

Gentle Satires

The Liverpool Journal of Commerce is now publishing a weekly edition. Obviously a very large part of its columns is devoted to maritime affairs owing to the abundance of this class of



The Surgeon has been called to treat an accident

news in Great Britain. Latterly it has started a joke competition in which the foibles of the cloth are very neatly touched upon. Every seafaring man will appreciate the gentle satire of the two cartoons which are reproduced here.

Busch-Sulzer Diesel Engine

The Busch-Sulzer Bros. Diesel Engine Co., St. Louis, Mo., has just closed contract with the Lake Torpedoboat Co. for six 600 brake horsepower two-cycle marine Diesel engines which are to be installed in three twin screw submarine torpedo boats now building for the United States government. The control of the engines now on order is so arranged that a single operator standing in one place between any two engines to be used in the same submarine has complete control over both. Each engine is provided with two separate scavenging pumps arranged in line with the working cylinders; also two

three-stage injection air pumps. All are operated from the crank shaft and each engine has its own oil and water circulating pumps. Excepting air storage bottles, these engines are complete units with all parts integral.

These marine engines are totally different in every way from the non-reversible two and four-cycle massive engines which the company is building for stationary purposes, or from the light-weight marine type Diesel generator sets supplied to the Argentine Republic for their first-class warships Rivadavia and Moreno.

Gun-crete Co.

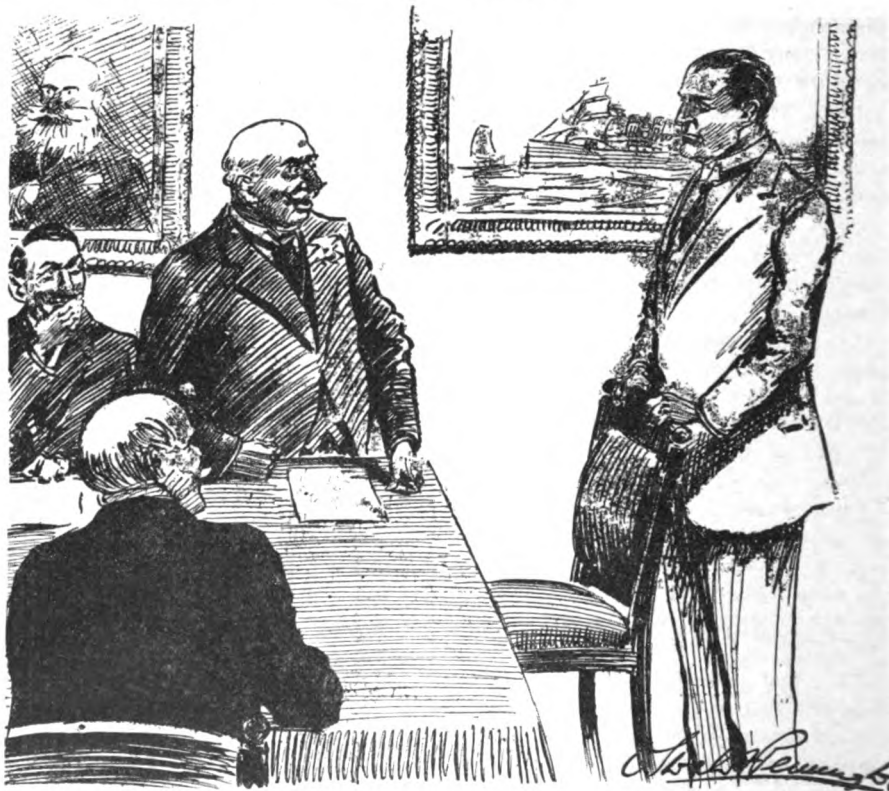
The Gun-crete Co. has opened its new offices in the McCormick building, Chicago. This firm specializes in cement gun work for engineering, industrial and mining structures. The cement gun process is especially valuable in connection with marine work. It is an efficient and economical method of protecting and waterproofing wharves, docks and similar structures. It has also been extensively used for the repair of sea walls, for the protection of wooden piles against torpedoes and for the encasing of steel structures of all kinds for rust and fire protection. Mr. Carl Weber is president of the company.

Steel Steamer

J. R. Hanify & Co., of San Francisco, shipowners and lumber operators, have awarded the Harlan & Hollingsworth Corporation, Wilmington, Del., a contract for the construction of a steel steamer for use on the Pacific coast, with a lumber-carrying capacity of about 2,300,000 ft. The vessel will be fitted with the most up-to-date appliances for handling of lumber, and will be delivered on the Pacific in February, next year.

Bids will be opened by the navy department Oct. 6 for the construction of the three super-dreadnaughts California, Mississippi and Idaho recently authorized by Congress. Their dimensions are: Length over all, 624 feet; length between perpendiculars 600 feet; breadth extreme 97 feet 4½ inches; draught 30 feet; displacement 32,000 tons; speed, 21 knots; armament, main battery, 12 14-inch guns and four submerged torpedo tubes; torpedo defense battery, 22 5-inch rapid-fire guns.

Nicholson ship logs have just been installed on the lake freighters Samuel Mather (big) and W. H. Crawford, and from information so far obtainable are proving very successful. A Nicholson ship log is also being installed on the Vanitie, one of the cup defenders.



Captain (explaining to Board of Directors the cause of his vessel's stranding in the Thames): "As soon as we had lost our way I ordered the engines—"

Director (indignantly interrupting): "Lost your way, Sir! Lost your way!! Do you mean to stand there and tell us that after the hundreds of times you have been up and down the river you are still capable of losing your way? Why, Sir—" (becomes incoherent).

Safety at Sea

*Progress in That Direction as
Indicated by a Japanese Professor*

By Prof. F. P. Purvis, Tokyo Imperial University

A GOOD deal has transpired since the reading of my paper before this Society in November, 1912. Principally the International Convention on Safety of Life at Sea has performed excellent work and made thoroughly practical suggestions and rules. In addition, the boat question, and subsidiary matters connected with it, have been attacked in a whole-hearted manner that promises well for a workable solution. The problems of an inner skin on the one hand, and of longitudinal subdivision with access through the dividing bulkheads on the other, have been advanced by practical application on the largest scale. Fire-proof bulkheads above the "margin line" have been made the subject of an article in the International Convention; and the Aquitania stands as at least one instance of their practical application (see Mr. Peskett's recent Institution of Naval Architects' paper). I shall therefore restrict my present communication to the discussion of a few matters which do not seem to me to have received quite sufficient attention. My earlier paper refers to several of them, and part of my present work will be to review my position in relation to what has since transpired.

The Inner Skin

Take first the matter of an inner skin, which has obviously so much to recommend it. In discussing the advantages of this structural addition I suggested that: "A detail, worthy of some consideration, would be whether the connection between the inner skin and the web-frames should not be rather slight, the inner skin being stiffened by independent frames; injury to the outer skin and the web-frames would then not necessarily involve any part of the inner skin, which might, even with such serious damage as the Titanic's, escape intact." The drawings which have appeared in recent periodicals, representing the arrangement for the inner skin of the Britannic, do not show that the end I had in view has commended itself to her designers; stringers of a very substantial character appear to connect inner and outer plating in a way which would make interaction certain under given conditions. I think the matter is

well worthy of further consideration in future designs.

Another matter in my earlier paper has not at present been taken up either by the International Convention or, as far as I have seen, in the design of any modern merchant ship. This matter is the possibility, or rather the practicability, of transverse bulkheads without water-tight doors. Dealing with a very limited class, I pointed out that: "In Atlantic ships, as exemplified by the Titanic or Mauretania, there seems no difficulty in arranging that each stokehold has its own bunkers; in such case the necessity for corporeal communication along the level of the stokehold floor does not seem absolutely urgent." The practical difficulties that would arise from such an arrangement I know are very great; I endeavored to deal with them. The class of ship, again, in which this would be even possible is a very small one, as counted by units. Measured by other standards it is, perhaps, the most important in the world; exceptional treatment would, therefore, appear to be not unreasonable. Results obtained in this very limited class might lead to the extension of the principle to other classes, but that does not call for immediate discussion.

The value of water-tight decks has received attention during the past year from many students of the general subject. Mr. Hillhouse read a paper last June at the summer meetings of the Institution of Naval Architects, and in it used the words "Water-tight decks form an exceedingly valuable form of subdivision." In the discussion on this paper Sir Archibald Denny appears to have accepted the statement, but laid stress on some of the difficulties. My own contention a year and a half ago was as follows: "In collisions with other steamers the area of damage is not at all restricted to the underwater portion of the ship; the impact which might be expected to tear open the ship's side would also tear away a large portion of any deck near the water-line; the stringer-plate certainly would be carried away for practically the same length as the damage of the outside skin; for that length, therefore, the transverse bulkheads would be called upon to play the same part whether the water-tight deck were fitted or not."

That contention, I think, still holds

good. Mr. Peskett, in his recent Institution of Naval Architect's paper dealing with the Aquitania, takes account of certain portions of deck as serviceable for the exclusion of water; but this he does to a very limited extent, and in view of other features of construction to which he attaches importance. Even then I do not think he meets the objection which I have stated above; the onus of proof would still lie with him. The International Convention, in Article 30, calls for further study in this and other matters.

International Regulators

Turning now to another of the International Convention's Regulations, a question is raised which is not, I think, solved in a manner entirely satisfactory. Article XV, paragraph 8 (a) provides as follows: "When the number of water-tight doors in the main transverse bulkhead at or about the stokehold level in the machinery space exceeds five, excluding the water-tight doors at the entrance of tunnels, all water-tight doors situated below the load water-line shall be capable of being simultaneously closed." (The context shows that they are to be closed by power). My objection to the provisions of this article is the large number—five doors. There are many steamers in this and other parts of the world with the boiler-room bunkers far too small for their needs; a large cross-bunker forward of boilers, either permanent or reserve (sometimes both permanent and reserve bunkers), is absolutely necessary; to pass the coal to the boiler-room there is a door or doors which can be shut water-tight. In some steamers there is a passage or tunnel from the boiler-room bulkhead to a light bulkhead separating cross-bunker from reserve; one water-tight door is considered sufficient, and it is placed at the boiler-room end; the bunker and reserve bunker openings are closed by light plates only. Where there is no such passage, and the door in boiler-room bulkhead opens at once into the reserve bunker, little is done, in some ships, to keep the coal clear of the door and the door slides. While visiting one or two steamers on recent occasions I have asked the engineers in charge the question how long, in case of emergency, it would take to close the door—working, say, from the grating above.

* Paper read at Japanese Institution of Naval Architects.

The answer has been "about ten minutes." It is to improve this state of things that I think some thing more should be done; surely every effort should be made to reduce this time interval to a minimum. The preferable method of doing this would be to substitute operation by power for operation by hand. In my earlier paper I made a suggestion with regard to the above-mentioned tunnel to extend its usefulness on the side of safety. Recognizing that suggestion as introducing too many difficulties for practical adoption, it seems to me that Article XV, paragraph 8 (a) of the Regulations might well be modified to make it compulsory even when there is only one door in the water-tight bulkhead dividing boiler-room from hold in front, that that door shall be operated by power, directed from the bridge or from some other suitable place. If this were done there would still be the necessity of keeping the coal clear of the door-slides; but on this point the Regulations are clear: Article XV, paragraph 5, provides that:

"In the case of water-tight bunker doors satisfactory arrangement shall be made by means of screens or otherwise to prevent the coal from interfering with the closing of the doors."

Thus in future, one of the elements of time in closing should be effectively dealt with. My proposal is meant to deal with the other.

In this connection, or partly in this connection, I should like to call attention to what indeed is thoroughly understood—viz., the fact that the Convention for the most part restricts its findings to passenger ships. Clause II defines the ships in view as "merchant ships * * * which carry more than 12 passengers." The restriction was probably quite unavoidable; as simplifying the problems involved it is eminently reasonable. But it may well become one's duty to take a wider field of view: the safety of cargo ships deserves consideration not much less than that of passenger ships. The regulations applicable to the one class ought in many instances to be applied to the other. In the matter I have just been discussing, for instance, many cargo-ships as well as passenger ships, have the door communicating between boiler-room and space in front. Such ships designed in the future would probably be influenced by the Regulations, both in this matter and in others to which the Regulations apply. Any discussion of the latter thus becomes of increased importance. Applicable in the first instance only to passenger ships, they will certainly indirectly affect cargo ships. The most important of them will probably in course of time, in most countries, be definitely extended by law to cover the latter class as well as the

former. The Regulations of the Convention may, in this respect, be considered as the first of two steps; the second is yet to be taken.

There is much room for discussion and consideration; and there is no doubt that in whatever is done, in whatever it is found possible to do, for the safety of ships, passenger and cargo ships alike, this country—Japan—will ever be ready to take its share.

Effect of the War

The effect of the great European struggle on the shipbuilding industry of Great Britain has not been anything like so great as on other industries, notably mining. Many reservists have, of course, left the shipbuilding centers for naval and military service; but, notwithstanding the shortage of material in certain directions—a shortage which is likely to become more serious—employment is plentiful. Warship construction, naturally is engrossing much attention; but in the yards where only merchant work is in progress, and in those where both naval and mercantile contracts are in hand, the latter are at present being pushed forward much as usual. Delay there will be in many cases as the war continues, but shipbuilders will be able to protect themselves against claims by ship-owning companies for late delivery under the clause in the building contracts covering delay arising from shortage of material. Naturally no new contracts are forthcoming, but the tonnage, both naval and mercantile, actually in hand is sufficiently large in volume to prevent anything like a serious shortage of employment for a considerable time to come. Builders have been asked, in the case of a few contracts placed by British and foreign firms just before the outbreak of war, to postpone the actual commencement with the ships, but it is fully expected that this postponement will be only temporary, unless—which seems improbable—the British war fleet suffers a serious disaster at the hands of Germany, resulting once more in the menace of the British oversea trade. According to the statistics available, only two merchant vessels of 7,950 gross tons were under construction in Great Britain for Austro-Hungarian owners when war was declared, and a like number for German firms, representing 4,290 tons. Another large vessel for German owners was ordered on the northeast coast just before the outbreak of war, but of course this contract has been cancelled.

As regards ship repairing, this industry is suffering probably more than shipbuilding. There is a tendency on the part of many repairing firms—particularly on the northeast coast—to decline merchant work which would occupy their dry docks for a lengthy period. Doubtless this policy is actuated by the desire

to be ready for any emergency arising out of a possible naval struggle in the North Sea.

As to warship work in private yards, it would not be patriotic to say more than that the whole forces of the shipbuilding industry have been unreservedly placed at the disposal of the British government. Just as in the world of home politics differences have been put into the background, so also shipbuilders and their employes have buried the hatchet for the time being, and the vexatious limitation of overtime by the trade unions and other contentious matters have disappeared.

Steamship Pensacola

The steamship *Pensacola* which has been built on the arch principle of construction for Furness, Withy & Co. Ltd., of West Hartlepool and London by Osbourne, Graham & Co. of Hylton, Sunderland went to sea for her trials recently when a speed of ten knots was obtained in the loaded condition. The dimensions of the vessel are 279 feet long by 40 feet 2 inches broad, 18 feet 9 inches deep with an arch of 6 feet. She carries about 3400 tons deadweight on 18 feet draft and has been built to Lloyd's highest class from plans supplied by the patent proprietors who are Swan, Hunter & Wigham Richardson, Ltd., and Mr. Maxwell Ballard.

The *Pensacola* has been designed as a general trader to carry ore and timber. She is the first of two vessels to be built on the arch principle for Furness, Withy & Co., the second vessel being built at the North of Ireland Shipbuilding Co.'s yard Londonderry. The machinery of the *Pensacola* has been supplied by Richardson, Westgarth & Co. Ltd., of Hartlepool and consists of a set of triple expansion engines, having cylinders 20½ inches x 33 inches x 54 inches with 36-inch stroke taking steam from two main boilers with a working pressure of 180 pounds per square inch.

Though the *Pensacola* is the first arch vessel built for Furness, Withy & Co. Ltd. it is the eighth arch vessel that has been completed in the last few years, and two others are in course of construction. That Furness, Withy & Co. should place orders for arch vessels points to a recognition of the advantages of this system of construction which have been conclusively established by the results of those vessels already in commission and the proprietors of the arch system are to be congratulated upon the definite progress made and upon securing such notable clients.

During the trial trip there were present D. Ross who superintended the construction of the vessel on behalf of the owners Mr. T. H. Patterson of Osbourne, Graham & Co. and Maxwell Ballard who represented the patent proprietors.

Kaiser der Grosse Sunk

Description of the Capture of the Union Castle Liner

Galician—Her Subsequent Encounter with the Highflyer

THE Kaiser Wilhelm der Grosse was fitted out as an auxiliary cruiser by the German government to seek and destroy the British merchant ships in the South Atlantic. She was equipped with eight 5.9-in. guns, four 4.7-in. guns, fourteen machine guns and several torpedos. She had captured three British ships including the Galician of the Union Castle Line when she fell in with the British cruiser High Flyer off the West Coast of Africa on Aug. 27. The result of the encounter was that she was sunk, though the British cruiser succeeded in rescuing the greater part of her crew. The Kaiser Wilhelm der Grosse was a favorite passenger liner and it is believed must have been short of fuel as she was a much faster boat than the High Flyer and never could have been overtaken by her under normal conditions.

In connection with this affair the following interesting narrative of the capture of the Galician was published in the *London Times*:

"On account of your women and children I will not sink the ship. You are released. Bon voyage." This message was released at 5 o'clock in the morning of Sunday, Aug. 16, by the captain of the Union-Castle liner Galician, from the commander of a German cruiser, believed to be the North-German Lloyd steamer Kaiser Wilhelm der Grosse. The story of the incidents which ended with the message is a remarkable one.

"S.O.S." Signal Sent Out

The Galician left Capetown on July 28. War had not then been declared, but a German gunboat was noticed busy coaling in the harbor. A call was made on Aug. 2 at Mossamedes, in Portuguese West Africa, to land a number of horses bought by the Portuguese authorities. On the same day the Galician resumed her voyage, making for Teneriffe. A few days out the news was received by wireless that war had broken out between Great Britain and Germany, and on Aug. 8 the following notice was issued by the captain:—

Owing to a state of war existing between England and Germany passengers are requested as a precautionary measure to draw curtains over the port-hole at night and not to leave the cabin light burning when not in use."

At the same time the ordinary route of the Cape liners was abandoned and a more westerly course was taken. Rumors were received that two German

cruisers were near Teneriffe, and passengers were accordingly informed that the liner would not touch at that island, although they knew that they had barely sufficient coal to take them home. At mid-day on Saturday, Aug. 15, while the Galician was off Ferro, the westernmost of the Canary Islands, about 90 miles from Teneriffe, a dark speck appeared on the horizon. It grew rapidly, and in less than half an hour a black, ugly-looking, four-funnelled steamer came alongside flying the German flag, and signalled to the Galician to stop at once and not to use its wireless apparatus. The wireless operator, however, quickly sent out the "S.O.S." signal, and had already sent the first three letters of the ship's name—"Gal"—when a second message came from the German ship, "Stop your wireless. We blow up the bridge if another letter leaves."

The next signal from the German ship—"It appeared to be the Kaiser Wilhelm der Grosse," says one of the passengers—was "Follow us," and at once the Galician turned to follow its captor at full speed towards the south. Presently a third vessel appeared in the distance and the German ship made straight for it, the Galician still following. The newcomer was a small steamer, painted grey, with a red and black funnel. She, too, was ordered to stop. She took no notice, and the order was repeated, again with no result. The order was given a third time, "Stop or we fire," and the steamer hove to. She signalled that she was a German liner disguised in the colors of the Union-Castle Line. The German cruiser was not satisfied, but after the newcomer had hoisted the German mercantile flag and given her name, she was allowed to proceed.

Then the onlookers on board the Galician saw a small boat lowered from the German cruiser, and it made towards her, bringing two German naval officers and some sailors. They were met on the gangway by the captain of the Galician and some other officers and shown into the captain's cabin. Here they asked to be shown all the ship's papers and confiscated them, giving a full receipt for them. Passengers and crew were then mustered and the cargo inspected, and the papers were found to be absolutely correct. There were about 30 second-class and nine first-class passengers on board, and the cargo consisted mainly of mealies for Hamburg and Antwerp, whale oil, and some ostrich feathers. The German officers signalled to their

ship for instructions, and talked of throwing the mealies—about 2,000 tons—overboard; but they received no reply. The next inquired of the officers of the Galician how many military and naval reservists were on board and were told not quite truly—that there were no naval reservists in the ship. The passenger list contained the names of two Army officers, and both were taken prisoners. The German officers asked very politely for quinine, and were given about 200 tablets. The purser next produced half a dozen boxes of cigars and some cigarettes, and the captain offered them to the Germans. The latter, however, refused to take them without payment. "We don't want it to be said that we robbed your ship," they explained. Similarly, when they were asked whether they were going to land the passengers on one of the islands, they answered, "We are not barbarians."

From the conversation which took place it appeared that the German ship had intercepted a wireless message from the Galician to Teneriffe asking whether the track was clear, as she wanted to put in to coal, and the Galician had received the reply—probably from the German ship—that the track was clear. The Germans asked if there was an English cruiser near, and were sceptical when they were told "No." Meanwhile the German sailors had gone to the Marconi cabin, destroyed the apparatus, and thrown part of it overboard.

Exchange of Courtesies

It was now evening, and orders came from the cruiser to go ahead at full speed southwards, showing no lights except the head lights. Passengers were to stand by at day-light the next morning, ready to be shipped. Further orders would be given later. The German officers, who had behaved throughout with the utmost courtesy, shook hands with the British officers and apologized for the trouble they had given. Then they went off, taking the two British Army officers with them. The passengers gave them a cheer as they went. The Galician steamed south throughout the night, closely watched by the German cruiser, which showed no lights at all. At 5 o'clock in the morning came the unexpected but very welcome message already mentioned. Immediately afterwards the cruiser steamed past at full speed, still going south, and disappeared from sight. The Galician turned northwards again and reached Gravesend safely.

Floating and Anchored Mines

How They Are Laid and the Means Employed to Remove Them—New Phase of Warfare

SUBMARINE mines unfortunately play a great part in modern naval warfare; so much so that separate branches of the Navy are specially trained in the laying and sweeping of mines. Although this method of conducting operations may be considered to be "hitting below the belt" (much more so than attacks by submarines proper, when every officer and man aboard carries his life in his hands), there is some justification for it when forming part of a definite plan of action against an opposing fleet; not so, however, when they are laid indiscriminately in neutral waters frequented by peaceful mercantile vessels of non-belligerent nations.

It is often thought that the process of sweeping for mines is a very dangerous one, but although by no means free from danger, it is not so hazardous as would at first sight appear. As is well known the process consists of dragging a rope with or without a net swung between two vessels of the trawler type steaming on parallel courses at a certain distance apart. The rope or net is carried some distance below the water, and engages with the anchoring rope of the mine or the mine itself, causing the latter to come to the surface, when it can be exploded. Mines are usually set at a distance of 18 or 20 feet below the surface, and as the mines-sweeping vessels used are specially chosen for their light draught, 10 feet maximum or thereabouts, it follows that the risk they run of actually striking a mine is much less than in a vessel of deeper draught.

Mines may be of several different kinds, and include floating and anchored mines; so far as is known the number of the former used is not nowadays very great as they expend such a large portion of their energy against a non-resisting medium, and are not so deadly as the latter, which are so placed as to explode in the region of the most vulnerable portions of a vessel, i. e., about 20 feet below the surface. The method of anchoring them at a certain pre-determined distance below the surface of the water is very ingenious albeit very simple. From the mine proper is suspended a windlass box, which contains a barrel on which a rope is coiled, together with mechanism for controlling it. This controlling mechanism is secured to a rope, which is made fast to a weight, and the amount of rope between this weight and the windlass box is equal to the exact distance below the surface at

which it is desired the mine shall be suspended. On being thrown overboard the mine floats on the surface while the windlass box, with the weight hanging below it, commences to sink, the windlass unwinding as necessary; as soon as the weight touches the bottom the tension of this lowest portion of rope is released, and this locks the barrel so preventing any more rope from being uncoiled. The weight of the windlass box being greater than the buoyancy of the mine, the latter, therefore, commences to sink until it is below the surface by an amount equal to the height the windlass box was above the bottom when the weight grounded, namely, the length of rope by which the weight is secured to the windlass box.

Unless any special arrangements are provided this distance must necessarily vary with the rise and fall of the tide, but with a 16-foot tide and a mine laid at near tide at a depth of 20 feet its maximum and minimum depths are 28 and 12 feet; the range between these two represents the distance below water at which it is fairly certain to cause the most vital damage.

Very ingenious have been some of the devices embodied in these deadly engines of destruction. One of the latest types is the oscillating mine, which has a propeller fitted underneath, by means of which it continuously rises and sinks between certain pre-arranged depths, such as from 20 to 30 feet down to just below the surface.

It is a somewhat curious thing that in all the technical discussions on battleship, design probable effect of submarines and modern torpedoes, which has taken place during recent years, very little was heard respecting the damage likely to be done by submarine mines. The question of protecting a vessel against torpedo attack has often been raised, and battleships have actually been so designed as to give some substantial protection against the explosion of torpedoes. The bursting charge that can be contained in a mine is much greater than can be fitted in torpedoes, and hence the effect of striking a mine is likely to be more serious than a successful attack by torpedo. The only possible manner in which protection can be given against mine explosions is by a very minute system of water-tight sub-division combined with immensely strong bulkheads; this, of course, need be confined to the fore part of the vessel only, as it is highly improbable that the after portion would strike

a mine after the fore part had successfully passed it, unless the helm were hard over.

Whether it is possible to make the fore part of a vessel sufficiently strong and sufficiently minutely sub-divided to give any reasonable protection against such an explosion is very difficult to say, as it is believed that no big ship that has struck a mine of recent years has survived, and so enabled us to judge of the effect of the explosion on the vessel's structure. It would, however, appear to be impracticable to attempt to so design war vessels that they could successfully resist mine explosions, especially as these might easily detonate the charges in her magazines. The present practice of sweeping is apparently the only reliable method of coping with this modern branch of deadly marine warfare.—*Liverpool Journal of Commerce.*

Obituary

John Phillip Holland, inventor of the submarine boat, died at his home in Newark, N. J., on Aug. 13, in his 72nd year. The invention of a submarine had been virtually an obsession with Mr. Holland practically since the civil war but it was not until 1898 that he was able to build a submarine torpedo boat. This submarine boat, known as the Holland, was purchased by the government directly after the conclusion of the Spanish-American war. Since that time hundreds of them have been built in various parts of the world.

Transatlantic steamship service is again becoming regular. With the exception of the Oceanic, Cymric and Minneapolis, requisitioned by the British government, all the passenger liners of the International Mercantile Marine Co. are now in regular service. Reports show that since Aug. 1 more than 25,000 passengers have been brought over to the United States. Antwerp and Southampton are for the present closed ports, and vessels scheduled for there will go to Liverpool instead.

The last issue of *American Wire Rope News*, published by the American Steel & Wire Co., is devoted to the Panama canal and is one of the most intelligent descriptions of the canal that we have ever read and it is interesting to note how large a part wires and cables have played in its construction.

Lloyds Register of Shipping

The 1914 edition of that invaluable shipping annual "Lloyds Register of Shipping" has recently been published. The book contains shipping statistics of great value and interest. One of the tables is particularly pertinent to the discussions which have been going on in this country of late as regards the inspection and classification of shipping. This table shows the number and tonnage of vessels classed by each of the classification societies of the world. While 9,648 steamers are classed in Lloyds Register Book, no other institution classes more than 2,833, while all the others come still further in the rear. The disparity is particularly marked in the cases of steamers of large tonnage. The total tonnage classed by Lloyds Register at the present time, including sailing vessels, approaches 24,000,000 tons, some 45 per cent of which is owned outside the United Kingdom.

This is undoubtedly a remarkable international position for Lloyds Register to have attained, and it raises the question—a very practical and urgent one for our shipping community—of the conditions and methods which are precedent to such worldwide recognition. No doubt very many causes have contributed to the success of Lloyds Register of Shipping in crossing all national frontiers. Its constitution—providing for the equal share in its government of all sections of the shipping community, its long history and its able officials have all helped to bring about this achievement. Success has led to further success, as is the case in all progressive business, and has provided the means whereby alone a great classification society can keep in the forefront in these days of big things. Lloyds Register relies at all shipbuilding and other important ports entirely upon the services of men who are in its exclusive employment and are not allowed to undertake private business. These competent and experienced officials are paid adequate salaries during active life and are eligible for liberal pensions upon retirement. Consequently, the service of Lloyds Register provides them with a career which would be irrevocably marred and broken by any failure from the high standard of duty required by the society. Moreover, the surveyors to Lloyds Register are not permitted to have any pecuniary or other interest direct or indirect in any business or industry which could affect or even appear to be liable to affect their perfect impartiality.

The activity of naval architects is

always producing fresh designs for economical construction, greater dead weight capacity on a given draft, improved machinery and boilers, and so on. Every such proposal is sure of a fair and unbiased consideration from Lloyds Register, for no one in its service is influenced by any consideration as to the effect the society's decision will have on his own pecuniary position. The only thing the staff has to consider is its professional reputation, and there is no inducement for it to depart from the path of justice, as indicated by the best scientific knowledge and experience.

First Commercial Trip

Commercial traffic between the Atlantic and Pacific oceans by way of the Panama canal was inaugurated on Saturday, Aug. 15, by the government steamship Ancon, which made the trip from entrance to entrance in approximately nine hours, well within the previously estimated time for the passage of a ship through the canal. The complete trip from the ship's berth at dock No. 9, Cristobal, to the end of the dredged channel, five miles out in the Bay of Panama, was made in approximately 9 hours and 40 minutes. There were no unscheduled delays, and the handling of the vessel in the locks and through the channel sections characterized the entire operation as one of the smoothest up to that time.

The Ancon carried, as guests of the secretary of war, about 200 people, the list including President Porras and his cabinet and other Panama government officials, the members of the diplomatic corps and resident consuls-general, officers of the Tenth infantry and Coast artillery corps, officials of the Panama canal, and a few others. A special train was run, leaving Panama at 5 a. m., on Saturday, conveying the guests from the Pacific end direct to the dock at Cristobal.

The vessel left its berth at about 7:10 a. m., arrived in the Atlantic entrance at 7:30, and at Gatun locks at 8 o'clock. It entered the lower lock at Gatun at the same hour and passed out of the upper lock on the water of Gatun Lake about one hour and a quarter later. The entrance to the Culebra Cut section at Gamboa was reached at about 11:15, and Cucaracha slide was passed at 12:20 p. m. Pedro Miguel lock was reached at 12:56, and the vessel passed into Miraflores Lake at about 1:19. It entered Miraflores lock at about 1:56, and passed out of the lower lock into the sea channel at 3:20. It arrived off Balboa docks at 4 o'clock, and reached the end of

the dredged channel at 4:30. This completed the official trip, and the vessel returned to Balboa, anchoring in the channel at about 5:10 p. m. People gathered to witness the passage at various points along the route, and at Balboa as many as 2,000 were present.

The Ancon is practically a twin ship to the Cristobal. Both were formerly owned by the Boston Steamship Co., and at one time were in the trade between Puget Sound and the Orient under the names of the Shawmut and the Tremont. They were purchased under authority of Congress contained in the Sundry Civil Appropriation Act of May 27, 1909, and were turned over to the United States government on Jan. 1, 1910. At the same time their names were changed, the Shawmut to the Ancon, and the Tremont to the Cristobal. They are steel twin screw steamers of 9,606 gross and 6,195 net tons each, and were constructed by the Maryland Steel Co. They were originally purchased for use as cement carrying ships, and were in that service, under the management of the Panama Railroad Co., during the period of lock construction. The Ancon on its first trip through the canal carried a quantity of cargo for delivery at Balboa.

Ice Breaker for Canada

The official speed trials of the car ferry and ice-breaking steamer which Cammell, Laird & Co., of Birkenhead, built for the Transcontinental Railway Co. of Canada, were successfully completed off the Mersey recently. She is intended for service in the St. Lawrence river between Quebec and Levis, and is arranged for the carriage of passenger and freight trains at all seasons of the year. Her principal dimensions are: Length, 326 feet; beam, 65 feet, with a draught of about 15 feet. The propelling machinery consists of two sets of triple-expansion condensing engines, steam being supplied by eight single-ended cylindrical boilers working under natural draught. An ice propeller of nickel steel, driven by a compound condensing engine, is fitted at the forward end of the vessel. The trains are carried on a tidal deck arranged above the main deck of the vessel, on three lengths of track, the length of each track being 272 feet. The tidal deck rests on castings working up and down on 10 vertical lifting screws on each side, supported on columns, the columns being stayed by lattice buttresses against longitudinal transverse thrusts. The lifting crews are hung

on ball-bearings from the top, and are manipulated by means of worm wheels driven from horizontal shafting which runs the length of the vessel on each side. The horizontal shafting is worked by bevel gearing from a four-cylinder high-pressure engine of special design situated below the main deck. The gearing is arranged to lift the tidal deck fully loaded with a train and locomotive weighing about 1,400 tons at the rate of 1 foot per minute, to a height of about 20 feet, which enables the ferry to be loaded or unloaded at any state of the tide. Exhaustive lifting trials have been carried out with entirely satisfactory results. At each end of the tidal deck an adjustable hinged gangway is suspended which allows for any change of trim or heel of ship due to unequal distribution of weights while taking the coaches on or off the vessel. Above the highest position of carriages on the tidal deck a promenade is arranged with a bridge platform forward, from which all the operations of steering and maneuvering are directed. The main propelling engines are situated abaft the boiler-rooms and the engine for the ice propeller is placed in the hold just abaft the fore peak bulkhead. The vessel is fitted with electric light throughout, and electric gear is provided for raising and lowering the end gangways and for hauling the railway carriages on and off.

Structural Features Considered

A naval architect in the *Standard*, London, has this to say concerning the Empress of Ireland-Storstad collision from the structural standpoint:

"The Empress of Ireland calamity serves to recall another collision which took place on July 27, 1912, in the same locality as the present disaster, but of which there was but little public notice taken at the time as there was no loss of life. There are certain circumstances, however, attending the two collisions which combine to form a grim coincidence. That of 1912 was between the Empress of Britain and the *Helvetia*. The Empress of Britain and the ill-fated Empress of Ireland were sister ships, and they were both built on the transverse system. The *Helvetia* and Storstad were built on the Isherwood system of longitudinal framing. In the 1912 collision it was the Isherwood vessel that was rammed amidships and sunk. In the present disaster it is the transverse vessel that has met with that fate, resulting, unhappily, in an appalling loss of human

life. To heighten the coincidence still further the two liners were built in the same yard, and so were the two Isherwood boats; the former by the Fairfield Ship Building Co., and the latter by Sir W. G. Armstrong, Whitworth & Co. The causes of the Empress of Ireland disaster will doubtless be duly cleared up at the official inquiry, but there is one respect in which the two collisions open up a wide field of discussion, and that is as to whether the Isherwood system or the transverse system offers the greater resistance to damage by collision.

"In arriving at a conclusion on this point there are many factors to be taken into consideration—the speed of the colliding vessels at the moment of collision, the part of the ship where the impact is received, and the dimensions and the displacements of the vessels. In the case of the present instance it will be seen from the following figures that the two transverse boats were larger and heavier than the Isherwood boats:—

"Empress of Britain.—Dimensions, 550 feet by 65 feet 9 inches by 40 feet; gross tonnage, 14,200 tons; displacement, 19,000 to 20,000 tons.

"*Helvetia*.—Dimensions, 375 feet by 52 feet by 30 feet 9 inches; gross tonnage, 4,950 tons; displacement, 10,500 to 11,000 tons.

"In size and tonnage the Empress of Ireland was the same as the Empress of Britain, but the Storstad is a larger boat than the *Helvetia* was. Her dimensions are 440 feet by 58 feet by 36 feet 2 inches. Her gross tonnage is 6,030, and her displacement 14,000 to 14,500 tons.

"In the collision of 1912 between the Empress of Britain and the *Helvetia* the former struck the latter amidships. Her nose was kept in the breach which she had made until the 40 people who were on board the *Helvetia* were rescued. The Empress of Britain was then backed out, and the *Helvetia* immediately sank. Photographs of the sinking vessel were taken at the time and the pictures were subsequently shown on the kinematograph. The Empress of Britain suffered very considerable damage, her fore part being almost completely carried away, although the ship with which she collided was smaller and lighter and had it not been for her collision bulkhead another terrible disaster would probably have been recorded.

"In the present disaster it is the transverse vessel which has been rammed amidships, and although the Storstad was the lighter of the two she appears to have lost comparatively

few plates. As to whether she would also have sunk had she not been built on the Isherwood system can only be conjectured, but the data which are available prove that this type of ship emerges from ocean mishaps and severe weather ordeals with comparatively little damage. In September, 1911, an Isherwood ship was collided with in Flushing Roads. She was the *Steinturm*, with a displacement of 11,500 tons, and the ship which collided with her was the *Marnix*, with a displacement of 4,000 tons. The *Steinturm* was rammed amidships, but she was able to continue on her long voyage after a temporary repair, and it was conceded at the time that had she been built on the transverse system the collision would have sunk her. Owing to the nature of the Isherwood system of construction, the impact in the event of a collision is received on longitudinal frames, and it is obvious that this must lessen the evil results. The force of the blow is resisted by these frames, and then transmitted to the strong transverses; but in the case of a vessel built on the transverse system, the damage is localized upon a piece of unsupported plating.

"With two appalling disasters, the need is imperative that every precaution be taken to avert a repetition of such terrible tragedies. Watertight compartments are excellent in theory, but they are fitted with doors, and as such, are dependent on the human element. This element can be eliminated by the construction of an inner skin, with hermetically sealed divisions, and a lead in this direction has already been given in the case of the *Olympic*."

Under the new subvention contracts concluded between the Hungarian government and the various shipping companies, Hungary has been enabled to increase its oversea service considerably. It has become possible for the *Adria Sea Navigation Co.* to increase its fleet and extend its services; the *Levant Sea Navigation Co.* has opened new services to Australia and has changed its former fortnightly service between Galatz and Constantinople into a weekly one, besides adding to its fleet; the *Hungarian-Crobian Sea Navigation Co.* starts an Albanian-Grecian line; the *Atlantica Sea Navigation Co.*—a "tramp-ship" line—has only been in existence about a couple of years, but its business is progressing favorably, and it has already at its disposal 11 modern steamers of, altogether, 64,500 tons capacity.